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Useful and Entertaining Knowledge.

"Get wisdom: and, with all thy getting, get understanding."

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HISTORY.

SKETCH OF THE HISTORY OF POLAND.

The important events which have lately occurred, and are now transpiring, in Poland, having rendered that country an object of deep and lively interest, at the present time, to the friends of liberty, both in Europe and America; a brief history of it will not, we presume, be unacceptable to our readers.

Poland derives its name from the word *Pohlen*, a plain; the whole country being almost entirely without any eminences, and so level that large portions of it are often inundated by the rivers which rise and unite with each other after a rainy season. It once formed a part of ancient Sarmatia; but its early history, like that of all other nations which took their rise previous to the general use of letters, is involved in doubt and obscurity. Historians, however, refer its origin to the middle of the sixth century, though the victories of Boleslaus I., in Bohemia and Moldavia, between the years 1005 and 1018, were the first indications of its power, and almost the first of its existence as a nation. This monarch was the first who assumed the title of king, the sovereigns having previously ruled under the title of dukes. Boleslaus instituted a senate, composed of the ministers of state, the representatives of the clergy, and the gentry, who were all, except the representatives of the clergy, nominated by the king, though when once appointed, they held their offices for life, were independent of royal authority, and formed a kind of barrier against the encroachment of the king on the one hand, and the nobles on the other.

From the death of this prince, who, by his valor and good conduct, had greatly extended the bounds of the kingdom, and promoted its prosperity, nothing transpired worthy of particular remark till the reign of Cassimir II.,

surnamed the Great, who ascended the throne in 1347. He was a liberal patron of literature, and founded an academy at Cracow: he also encouraged industry, commerce, and the arts, and gave to the kingdom its first code of written laws. Under his reign the nation enjoyed a high state of prosperity, and made rapid advances in wealth, power, and civilization; but he was doomed to be the last of his race. His death, which happened in 1370, was mourned as a serious calamity to his people. Cassimir was succeeded by his nephew Louis, king of Hungary, and he, in turn, by his youngest daughter, Hedwiga, who was elected by the Diet.

About this time the constitution of the kingdom underwent an important change, of which it may be proper here to take some notice. For five centuries previous to the death of Cassimir, the crown had been hereditary, and the power of the sovereign absolute; but circumstances now combined to enable the nobles to change the monarchy from a hereditary, to an elective one, and to diminish the power of the king, and extend their own, of which they did not neglect to avail themselves. "They enacted that no taxes should be levied, that no new laws should be passed, and that no measure of any importance should, as formerly, be adopted by the king, but by consent of representatives chosen from among themselves:" and further, that the throne should thereafter be filled by an election by the Diet. Hence the origin of the Diets of Poland. The Diets, composed of the senators, representatives of districts, of the nobles, and the clergy, amounting to about 400 members, were of two kinds, ordinary, and extraordinary: the ordinary Diet assembled statedly once in two years; but the extraordinary Diet was only called together on very important accasions, by the king, who presided, or, in case of an interregnum, by the Archbishop of Gnesna, who was president of the senate, and who, during such interregnum, discharged the functions of king, and enjoyed all the royal prerogatives, except that of dispensing justice.

One extraordinary feature in the constitution of the Diets was, the right of any member, however humble, of preventing the adoption of any measure, or the passage of any law, or even the election of a king, by simply protesting against the proceedings of the Diet, no measure being legally carried unless by the *unanimous* votes of all the members. From this circumstance, the Diets which assembled to elect a king, were generally mere assemblages of combatants, who came armed with sabres and pistols for the purpose of forcing their antagonists to assent to the election of their candidate. The electors met on horseback, on a plain near Warsaw, which was not unfrequently the scene of a sanguinary conflict. Before the successful candidate could ascend the throne, he was required to sign the *Pacta Conventa*, or conditions upon which he received it, and swear to observe them; these conditions left him little besides the mere name of king.

Such was the ancient constitution of Poland: "Monarchy," says an able writer, "blended with aristocracy, in which, for several centuries previous

to its dissolution, the latter prevailed. The Poles, indeed, denominated their government a *Republic*, because the king, so extremely limited in his prerogatives, resembled more the chief of a commonwealth, than the sovereign of a monarchy. But it wanted one of the necessary characteristics of a republic: The people were kept in a state of slavery and vassalage, and enjoyed not even the semblance of any civil privilege: the whole power was engrossed by the nobles; and thus the Polish constitution possessed not that community of interests, that general diffusion of political privileges, which are the very life and stamina of a republic, as well as of a mixed monarchy, and with which, in spite of much internal misrule, and of the aggressions of foreign enemies, Poland might have flourished till this day."

Not long after the elevation of Hedwiga to the throne, she married Jagellon, grand duke of Lithuania, who, to obtain her hand, became a christian, and was baptised by the name of Uladislaus. He united his hereditary dominions to the kingdom of Poland, conquered Samogitia, and defeated the Teutonic Knights, in the sanguinary battle of Tannebury, in 1410.

Situated on the frontier of Europe, the Poles were almost continually engaged in wars with the Tartars and Turks, whom they often defeated, and whose incursions into Europe were thus arrested; but notwithstanding the severe and continued conflicts with these hordes, and with the semi-barbarous Russians, the kingdom continued to advance in power and prosperity, till it arose to its highest pitch of glory during the reign of Sigismund I., who possessed not only the kingdom of Poland, but the grand duchies of Lithuania, Livonia, Volhynia, Podolia, and Kiow, besides vast territories lying beyond the Baltic and Euxine: his nephew at the same time possessed the kingdom of Bohemia, Hungary, and Silesia. He was an accomplished prince, and equally distinguished for his skill and intrepidity in war, and the mild and civic virtues in peace.

With this prince terminated the male line of the house of Jagellon, which had filled the throne about two hundred years;—"a family," says an elegant writer of the present day, "as wise and virtuous, as celebrated and brave,—a family under whom Poland saw herself enjoy internal tranquillity and the respect of neighboring nations, under whom she was rendered eminent by the multitude of her scholars in every department of human knowledge."*

There being no hereditary prince to claim the throne on the death of Sigismund, two powerful foreign princes, Henry de Valois, brother of Charles the IX., king of France, and Maximillian, of Austria, became candidates for it, and each endeavored, by intrigue, management, and bribery, to secure his own election. The members of the Diet, instead of consulting the good of the nation, sought only to advance their own individual interests, and were ready at all times to sell their votes to the highest bidder. At length Henry was elected; but scarcely was he seated on the throne when, by the

* Malte Brun.

death of his brother, he became heir to the crown of France. Preferring the throne of the Charlemagnes to that of the Jagellons, and knowing that the Poles would oppose his departure, he secretly left the kingdom: he was urgently solicited to return, but obstinately refused, and was therefore (1575) formally deposed, and the throne declared vacant.

On the deposition of Henry, the kingdom once more became a scene of faction and violence. Two candidates again aspired to the throne, and were supported by their respective parties; these were Maximillian, emperor of Germany, and Stephen Batthori, prince of Transylvania; the latter having entered Poland, and married the princess Anne, daughter of Sisgismund, was, on that account, as well as on account of his many personal qualifications, elected and crowned, first of May, 1576. Batthori proved himself equally brave and virtuous,—and fortunate indeed were the Poles in having committed the affairs of the kingdom to one so well able to conduct them. All acquiesced in the choice that had been made, except the citizens of Dantzic, whom Batthori reduced to submission, after a sanguinary and obstinate struggle. He next turned his arms against the Czar of Russia, whom he severely chastised for having invaded and devastated a part of his dominions, and exercised the most shocking and inhuman barbarities on such of the Poles as fell in his power. Having obliged the Czar to sue for peace, which he obtained by ceding the province of Livonia to Poland, Botthori applied himself to the internal government of his kingdom. He organized the Polish cavalry in such a manner as made them extremely formidable to his enemies, the Russians, Turks, and Tartars; formed the Cossacks, whom he united to the kingdom, into a corps of militia, and granted them several important privileges, besides causing them to be instructed in manufacturing cloth, and other peaceful arts, of which they were before entirely ignorant. The civilization of the Cossacks was among the last, as well as most important, acts of Batthori: he died in 1586, leaving behind him the character of a wise, prudent, intrepid, and patriotic prince. The death of Batthori involved Poland in fresh troubles. Four candidates now urged their claims to the throne, and the country was divided into as many parties, or factions. A civil war ensued, and some blood was spilt; but Sigismund, of Sweden, nephew of the wife of the late king, was finally placed upon the throne.

During the reign of this and the three succeeding monarchs, Uladislaus VII., John Cassimir, and Mahomet IV., though the Poles gained some signal victories over the Cossacks of the Ukraine and the Tartars, as also over the Russians and Swedes, yet they lost the important provinces of Livonia, Smolensko, and Kiow; the former being ceded to Sweden, then under the sway of the great Gustavus Adolphus, and the two latter to Russia. The loss of these territories greatly weakened the power of the kingdom, and temporarily bedimed the glory of the Polish arms; this, however, was soon restored by one whose illustrious name fills a bright page in the history of his country.

John Sobieski, who was elected in 1673, was one of the most distinguished monarchs that ever sat upon the throne of Poland, both on account of his eminent virtues, and his extraordinary military talents. Having gained several signal victories over the Turks, he forced them to retire, and to conclude a peace with him; upon which they turned their arms against the emperor of Germany: they invaded Austria, defeated the imperial troops, advanced with a rapid and victorious career to the very gates of Vienna, laid siege to that city, and were on the point of taking it, when it was seasonably relieved by Sobieski, whose assistance had been implored by the emperor. At the head of 40,000 of his brave Poles, Sobieski made forced marches, until he arrived in sight of the enemy: here he was joined by about 10,000 Germans, and at the head of this army he attacked the Turks 200,000 strong, with such impetuosity and determined bravery, that they were completely routed. The whole Turkish camp, together with immense treasure, the splendid tent of Soliman, the great Ottoman standard, and 180 pieces of artillery, were the trophies of this battle—the most important and memorable of the age.

Sobieski died in 1696, and with him fell the power of the kingdom. As usual, the election of a successor threw the nation into commotions and contests of the most violent kind. At length the good fortune of Frederick Augustus prevailed. Soon after his election, having entered into a league with Denmark and Russia, against Sweden, he was attacked and dethroned by Charles XII., who placed the crown on the head of Stanislaus Leczinski. On the memorable defeat, however, of Charles, at the battle of Pultowa, Stanislaus was deposed, and Augustus restored to the throne, which he occupied till his death, in 1763.

That system of intrigue, hypocrisy, and perfidy, which finally accomplished the dismemberment of the Polish kingdom, and its division among those who plotted the destruction of its liberties, dates its origin from this time. The throne of Poland being vacant by the death of Augustus, many candidates were ambitious to obtain it; but the politic and crafty Catharine II., empress of Russia, determined that it should be occupied by no one who would not be submissive to her wishes, proposed her former lover, Stanislaus Poniatowski, as a candidate, and took care to secure his election by the Diet, by stationing bodies of troops in different parts of the kingdom, and particularly near Warsaw. Poniatowski was accordingly elected 7th Sept. 1764, and took the name of Stanislaus Augustus: "He was," says a writer in the Edinburgh Encyclopedia, "an amiable and patriotic, though not a very energetic, character. Whatever had been his talents, however, Poland, before his time, was rapidly hastening to decay; and during his reign he saw it completely erased from the list of nations."

Our limits will not permit us to enter into a detail of the causes that led to the dismemberment of the kingdom of Poland; those who desire to obtain a more thorough knowledge of the important events connected with the

downfall of Poland, will find them amply detailed in various historic works —suffice it say, that the dissensions between the Protestants, called *Dissidents*, and the Catholics, arose to such a pitch of rancour as finally to result in a civil war. The Protestants on the one side, applied to Russia and Prussia for advice and assistance, while the Catholics, forming themselves into a confederation, called "*The Confederation of the Barr*," took up arms, not only to destroy their opponents, but to dethrone Stanislaus, who was believed to be favorable to them. These circumstances gave Russia and Prussia a plausible excuse for filling Poland with their troops: with the aid of these, the Dissidents were every where victorious, and might have secured to themselves the enjoyment of their faith and of civil liberty, had the sovereigns, whose assistance they had implored, acted in good faith, or had they not "trampled under foot every principle which the law of nations—which the law of nature, should have taught them to cherish and reverrence."

There can be no doubt but the dissensions between the Catholics and Dissidents were fomented, or greatly increased, by the emissaries of those very sovereigns who lent their aid to one party to destroy the other, under the hypocritical pretence of espousing the cause of civil and religious liberty; but who having under such false pretence filled the kingdom with their troops, perfidiously, and in violation of every principle of right and justice, seized upon a considerable portion of it, and divided it among themselves.

"Europe," says the writer, whom we have before quoted, "though astonished at what was taking place in Poland, remained inactive. The courts of London, Paris, Stockholm, and Copenhagen, indeed, sent remonstrances against this usurpation; but remonstrances without a military force will, as in the case before us, be always unavailing."

Russia took to herself a large portion of the eastern provinces; Austria, sharing in the spoil, accepted a fertile tract on the south west; while Prussia acquired a considerable commercial district in the north-west.

This first spoliation deprived Poland of about 5,000,000 of subjects, of which Russia took 2,000,000; Austria 2,000,000, and Prussia 1,000,000.

Although the dismembering powers had thus helped themselves to large slices from this ill-fated kingdom, yet they were by no means satisfied, and looked upon what they had already obtained as merely preliminary to greater acquisitions. It was the policy of the artful Catherine to foster the dissentions and animosities with which the country was filled, and endeavor to render the constitution of Poland as odious as possible, and with this view she procured some alterations to be made in it in 1782, by which the power of the executive was weakened, and the anarchy of the Diets ensured.

The great body of the nation being dissatisfied with the constitution as thus altered, and with the present state of things, and Catehrine being engaged in a contest with the Turks, a Diet was convened for the purpose of establishing a new constitution upon more liberal and unexceptionable

principles: this constitution was promulgated on the 3d of May, 1791: its principle provisions were, that the throne should be hereditary—the dynasties elective—the ministers responsible—the Catholic religion the religion of the state, but all others tolerated—the manumission of the peasantry was provided for, the Burgeoise were made eligible to all civil and military employments, and the nobility formed two legislative chambers. So admirably was this constitution constructed that Mr. Burke declared that it improved the condition of all, while it infringed the rights of none.

But the Poles were not destined to enjoy that national happiness which this constitution was so well calculated to insure, and which they now looked for with confident hopes. A few discontented nobles, devoted entirely to the Russian interests, formed a confederation at Targowitz, for the purpose of overturning this constitution and the present order of things, repaired to the court of St. Petersburgh and solicited the aid of Catharine, who, ever ready to interfere in Polish affairs, and now relieved of the war with the Turks, despatched an army into Poland, under the pretence of restoring the confederates to their rights. The Poles were roused to resistance. All animosities were now forgotten; and "had Stanislaus," observes an able writer, in a late number of the London New Monthly, "then complied with the wishes of the Poles, and trusted to the abilities of his generals, he might have maintained the honor of his crown, and placed the independence of his country on the most solid basis. But by listening to the proposal of an armistice, he put a stop to every military measure, paralyzed the national energy, lost the fruits of the advantages already gained by Kosciusko, and made himself fully deserving of the shame and misfortunes which soon after befel him." Taking advantage of this armistice, the Russians entered Warsaw, and the king became the prisoner of his former mistress.

Frederick, king of Prussia, who had highly approved the constitution of 1791, now, to the utter astonishment, not only of the Poles, but of all Europe, issued a manifesto, reproaching the poles with their resistance to his councils and the benevolent intentions of the empress! He bewailed the unhappy situation of Poland, convulsed as it was by anarchy; professed great alarm at the progress of French principles in Poland, and concluded by saying, that "He was compelled by these reasons to the taking possession of Thorn, and Dantzic, and a part of Upper Poland, in order to restore tranquillity to that country, and afford protection to the well intentioned Poles." These places were accordingly immediately filled with Prussian troops, who bore themselves towards the inhabitants as if they were a conquered people. The intentions of the Russian and Prussian sovereigns were now openly and impudently announced. On the 9th of April 1793, they published a declaration which disclosed their nefarious designs: "They could not," they say, "devise any surer means for their respective safety than by confining the Polish republic within narrower limits, and by as-

signing to it an extent and an existence suited to a power of an inferior order." The injustice and baseness of this declaration, was only equalled by its impudent and hypocritical professions of solicitude for the welfare of Poland. "The world," observes the writer in the New Monthly, "had to be taught a new species of charity—the subjection of a free people, for no purpose on earth but to increase their happiness."

The resolution of the dismembering sovereigns thus announced, was submitted to a Diet called for the purpose by the Russian minister, who informed the Diet "that he had thought it absolutely necessary, in order to prevent every kind of *disorder*, to cause two batallions of grenadiers,(20,000 men,) with four pieces of cannon, to surround the castle, *to secure the tranquillity of their deliberations;*" and "he expected that the sitting *would not terminate* until the *demanded signature* of the treaty [the dismemberment of the kingdom] is decided." There was no alternative in such a case but submission, though they accompanied this by a remonstrance, and an appeal to every power in Europe. This arbitrary and tyrannical act, together with the ruthless conduct of the Russian soldiery towards the peasantry, roused the ancient spirit of the Poles. The brave Madalinski first raised the standard of liberty in March, 1794, to which thousands immediately flocked. The gallant Kosciusko appeared at Cracow, and was declared generalissimo: the utmost enthusiasm animated the troops and the nation, and all vied with each other in demonstrations of patriotic ardor and devotion: with 4,000 men, principally peasants, armed with pikes and scythes, Kosciusko defeated 7,000 Russians, and took twelve pieces of cannon. This was a signal for general hostility: the Russians had seized upon Warsaw, and attempted to gain possession of the arsenal, but were resolutely attacked by the inhabitants, and after a most desperate contest, which lasted three days, were forced to retire with the loss of 6,000 men. The Polish army now amounted to 60,000 men, while that of the confederates amounted to 110,000, and these were soon after reinforced by additional corps. The eyes of all Europe were now directed to this unequal and unhallowed conflict—the brave Poles performed prodigies of valor, and fought with the desperation of men contending for their dearest rights—but, after defeating their enemies in several bloody engagements, they were finally overpowered by numbers, on the 19th of October. Kosciusko, after sustaining an almost incessant combat for several days, against ten times his own number, was desperately wounded and taken prisoner. This battle broke the power of the nation and decided its fate. Warsaw, from which the Russians and Prussians had been successively driven by the bravery of its citizens, was now again invested: the Polish troops, however, in that city, "few, but undismayed," resolved to make a desperate resistance; they defended themselves and the city with the determined resolution of men who preferred death to slavery, and for eight hours nobly sustained the unequal conflict, but were at last borne down by numbers, and "died their

land defending." The city was obliged to surrender at discretion, and was entered by the infamous Suwarrow, at the head of his vandal-like troops. Unsatiated by the blood of those who had shed it in the defence of their country, the Russians, soon after entering the city, set fire to it, and at the same time commenced an indiscriminate slaughter of its inhabitants—they spared neither age nor sex, and glutted their vengeance by the death of 20,000 victims. Stanislaus was removed to Russia, where he remained a state prisoner till his death, in 1798.

The rapacious Catherine and Frederick were now about to divide the conquered country between themselves, when Austria, being suddenly seized with a holy horror of oppression and injustice, interposed her remonstrances; her scruples, however, were allayed by being admitted to share in the spoil, and Poland, that had for centuries repelled the incursions of the hordes of Tartars, that would otherwise have precipitated themselves upon the interior of Europe, was now dismembered and erased from the list of nations. The three powers divided the country between themselves, each taking a portion laying contiguous to his own dominions:

	Square miles.		Inhabitants
Russia took - - - - -	168,000,	and	6,700,000
Austria - - - - - - -	64,000,	and	4,800,000
Prussia - - - - - -	52,000,	and	3,500,000
	284,000		15,000,000

But the dismemberment of the kingdom was not the only act of lawless tyranny of which the spoliators were guilty;—such patriots as dared to murmur at the fate of their country, or showed any restiveness under the yoke which had been imposed upon them, were either thrown into prison, banished to the cold, inhospitable, and dreary regions of Siberia, or forced to seek the enjoyment of that liberty in foreign countries of which they were deprived in their own. Many of the Poles took up their residence in France, and when, in 1797, the arms of their enemies were turned against their adopted country, they were the first to rally around the standard of liberty: they were formed into a corps, known as the Polish Legion, which, under Napoleon, was distinguished for its chivalrous courage, and the terrible havoc it often made in the ranks of the enemy.

In 1807, Napoleon having stripped Prussia of a part of her Polish acquisitions, erected it into a new state, denominated *the Grand Duchy of Warsaw;* and, in 1809, having wrested Gallicia from Austria, he added that province to the new duchy. The fall of Napoleon, however, produced another change in the destiny of Poland. At the congress of Vienna, (1815) a new kingdom was erected, under the name of *the Kingdom of Poland*, consisting of several of the central provinces of ancient Poland, and of which Warsaw is the capital, and nearly the centre. The kingdom contains about 3,000,000 inhabitants, and was, till the late insurrection, under the sovereign-

ty of the emperor of Russia, who governed it by a viceroy, the grand duke Constantine.

The Poles have, in all ages, shown a love of liberty, and an indomitable spirit;—this spirit has now prompted them to rebel against the arbitrary government of a foreign viceroy; but whether they are destined to shake off the yoke of slavery, or to have it riveted with a still more galling weight upon their necks, time only can develope: one thing, however, appears to be certain, that the soil which was moistened by the blood of the gallant Kosciusko, will again be drenched with that of patriots who are willing to shed their last drop in the glorious struggle for freedom and independence. The banner of liberty has been raised, and around it the young and the old, the high and the low, the nobleman and the peasant, gather with the ardent enthusiasm of men determined to be free;—the rich make an offering of their wealth for the purchase of arms, and the women, ever most enthusiastic in the cause of liberty, now, as in 1794, offer up their ornaments upon the altar of their beloved country. To the result of the struggle which is about to commence, nay, which has probably already commenced, no friend of liberty, whether in the eastern or western hemisphere, can feel indifferent, and it must be their ardent wish that the people of Poland, that country of wrongs and sufferings, having dared to assert their rights, may not want the physical power of maintaining them, and of again giving their country a seat among the nations of the earth.

An account of some of the most important battles recorded in the ancient and modern history of Europe, and in which Europeans were engaged;—chronologically arranged.

[Continued from page 81.]

BATTLE OF THE GRANICUS, B. C. 338, between the Persians under Arsites, and the Macedonians under Alexander.

This was the first battle fought by Alexander, on his entrance into Persia, and was one of the series which resulted in the conquest of that empire.

BATTLE OF ISSUS, B. C. 333, between the Macedonians under Alexander, and the Persians under their king, Darius.

Alexander had already subdued a considerable part of the Persian empire: anxious to recover this, Darius raised an army of 400,000 foot and 100,000 horse, with which he attacked the Macedonians, but was defeated, with the loss of 70,000 slain, and 40.000 prisoners.

BATTLE OF ARBELA, B. C. 331, between the Macedonians, commanded by Alexander, and the Persians under Darius.

Alexander, returning from Assyria and Egypt, which he had overrun, was met by Darius, with an army of 700,000 men. Peace, with his daughter, and 10,000 talents, were offered by the latter, but rejected by "Macedonian's Madman," who defeated the Persians, and left 300,000 of them dead on the field. Darius fled, but was murdered by one of his own officers, and the empire submitted to the conqueror.

BATTLE OF ASCULUM, B. C. 280, between the Romans under Fabricius and Curius, and the Epirots and Tarentines under Pyrrhus.

Pyrrhus, an ambitious prince, and one of the greatest warriors of the age, had invaded the Roman territories; but though he could defeat the Romans, he found it impossible either to subdue them with force, or corrupt them with bribery. When congratulated by one of his officers on the victory which he had gained in this battle, he replied, that "one more such would ruin him."

BATTLE OF BENEVENTUM, B. C. 274, between the Romans under Curius, and the Epirots and Tarentines under Pyrrhus.

Pyrrhus was, in this engagement, defeated by the Romans, whose numbers amounted only to about one half his own, with the loss of 26,000 men, and immediately after evacuated the country.

SIEGE AND CAPTURE OF AGRIGENTUM, B. C. 260. This was a city of Sicily, belonging to Carthage; it was besieged and taken in the first year of the Punic war, by the Romans and Syracusans under Regulus, who was opposed by the Carthagenians and Agrigentines under Hamilcar.

BATTLE OF CANNÆ, B. C. 216, between the Carthagenians under Hannibal, and the Romans under Paulus Æmilius and Varro.

This was one of the most sanguinary battles recorded in the history of Rome. The Romans were defeated, with the loss of 40,000 slain, among whom were the consul Æmilius, and almost the whole body of knights. Rightly improved, this victory would have been decisive of the fate of Rome; but while the conqueror deliberated whether to attack the city, the opportu-

nity of reducing it was lost: the Romans recovered from the panic into which their terrible defeat had thrown them, rallied again, and finally drove Hannibal out of the country.

SIEGE AND CAPTURE OF SYRACUSE, B. C. 212. Syracuse, a celebrated city of Sicily, had lately joined the Carthagenians against the Romans, and thus brought down the vengeance of the latter, now victorious, upon herself: the city was besieged by the latter, who were commanded by Marcellus, and assisted in their defence by the former, under the command of Hannibal. The siege was protracted by the ingenious and effective machines which were constructed for its defence by the celebrated Archimides: it was, however, taken, plundered, and became a Roman province—what is most to be regretted, is the fate of Archimides, who, being commanded by a soldier, that had entered his room, to follow him, and refusing to do so till he had solved a problem on which he was engaged, was killed on the spot.

BATTLE OF ZAMA, B. C. 202, between the Romans, commanded by Scipio, and the Carthagenians under Hannibal.

This battle decided the second Punic war: the Carthagenians were totally defeated, and compelled to accept of peace on the most humiliating terms.

BATTLE OF PYDNA, B. C. 168, between the Romans, under Æmilius, and the Macedonians, under their king, Perseus.

This battle put an end to the kingdom of Macedonia. Perseus, its last king, was taken captive, and carried to Rome, to grace the triumph of Æmilius; and the country now became a Roman province.

SIEGE AND DESTRUCTION OF CARTHAGE, B. C. 147. The third Punic war ended in the destruction of that once powerful commercial city, Carthage.

The Romans, who were commanded by Scipio Africanus, first required the Carthagenians, after having defeated and shut them up within the walls of the city, to acknowledge themselves their subjects—this they assented to: they then required three hundred hostages; these being obtained, they demanded that the walls of the city should be razed to the ground; this the Carthagenians resisted, and the city was accordingly besieged;—

driven to despair, they made a noble but ineffectual defence—the city was taken by storm, the walls razed, and the inhabitants put to the sword.

DESTRUCTION OF THEBES, CORINTH, AND CHALCIS, B. C. 147. The destruction of these cities by the Romans, under Mummius, decided the fate of Greece.

That country which once withstood the Persian hosts, now became a province of the Roman empire.

CIVIL WAR IN ROME, B. C. 88. For six years the contests between the factions of Scylla and Marius, deluged the city with the blood of its most valuable citizens; but Scylla finally triumphed, and became perpetual Dictator.

BATTLE OF PHARSALIA, B. C. 49, between the Romans who adhered to Pompey, and those who espoused the cause of Cæsar.

Cæsar and Pompey, both ambitious of unlimited power, sought to gain the ascendancy in the government—a war ensued. The Consuls, and a considerable part of the Senate, were friendly to Pompey; but the army adhered to Cæsar: this battle was the consequence. Pompey was defeated, and Cæsar became absolute master of the empire.

BATTLE OF PHILLIPPI, B. C. 42. Cæsar having destroyed the liberties of his country, Brutus, Cassius, and others, formed a conspiracy to take his life, and he was accordingly assassinated while attending the senate. Parties were immediately formed, at the head of one of which was Octavius, Anthony, and Lepidus; the other was headed by Brutus; the contest was decided by this battle; the Triumvirate were victorious, and their power was sealed by the sacrifice of 300 senators, and 3000 knights, among whom was Cicero, the great Roman orator.

BATTLE OF ACTIUM, (*Naval*) B. C. 31, between the Romans under Augustus, and the Egyptians and Romans under Anthony and Cleopatra.

Intoxicated with love, and immersed in luxury, Anthony forgot ambition, duty, and every thing in the arms of Cleopatra, whom he had been sent to chastise, but on whom he lavished the wealth and provinces of the empire. The divorce of his wife, Octavia, was the signal of hostilities between him and Octavius. Anthony was defeated, and both he and Cleopatra committed suicide. Octavius now became sole master of the empire, with the title of Augustus.

CHRONOLOGY OF IMPORTANT INVENTIONS,

Discoveries, and other interesting events relating to the improvement of society.

A.D.

373 The Bible translated into the Gothic tongue.
421 The Salic Law promulgated.
529 The Justinian code published.
551 The manufacture of silk, brought from India into Greece.
605 Bells first introduced into churches.
606 The Court of Chancery, instituted in England.
660 Organs first used in churches.
674 Glass introduced into England.
788 Pleadings in Judicial Courts instituted.
800 Horse shoes introduced into general use.
819 A degree of longitude measured on the plains of Sinjar.
854 Tithes first granted in England.
886 Alfred founded the University of Oxford.
887 Parchment invented, by King Attalus.
890 Alfred divides England into counties, and completes his code of laws.
919 Tilts and Tournaments commenced in Germany.
939 The Bible first translated into Saxon.
979 Juries first instituted by Ethelred.
991 Arabic figures first brought into Europe, by the Saracens.
1000 Paper first made of cotton rags.
1025 Musical characters invented by Aretino.
1066 The first Earl created in England.
1070 The Feudal system introduced into England.
1100 Heraldry took its rise.
1102 Sir-names first used in England by the Normans.
1118 The order of Knights Templars instituted.
1130 Roger, King of Sicily, brought artisans from Athens, and established the manufacture of silk in his kingdom.
1137 The Roman Pandects found at Amalphi.
1153 Linen first made in England.
1157 The Bank of Venice (the first) established.
1164 The Herring Fishery began in Holland. The distillation of spirituous liquors began about this time.
1180 Glass windows began to be used in England.
1181 The laws of England digested by Glanville.
1191 Coarse woollen cloths introduced into England.
1197 The College at Padua founded.
1200 Chimnies first used in England, but only in the kitchen and large hall.
" The University of Salamanca founded.
1204 The Inquisition established by the Pope.
" First regular Parliament in England.

1209 The manufacture of Silk began in Venice, by Greek weavers.
1213 Academical degrees first conferred at Paris.
1215 *Magna Charta* granted.
1220 Astronomy and Geography brought into Europe, by the Moors.
1228 University of Thoulouse founded.
1234 Coal first discovered at New Castle.
1236 College at Vienna founded.
1250 College of Sorborne founded.
1252 Magic Lantern, invented by Roger Bacon.
1253 Linen first made, in England.
1257 Weights and Measures fixed to a standard, in England.
1260 Magnifying Glasses, invented by Roger Bacon.
1264 Deputies of boroughs first summoned to Parliament.
1280 Coal came into general use in England.
1290 Spectacles invented by Spina, a Monk of Pisa.
" Candles first used in England.
1300 Algebra first introduced into Europe, by the Saracens.
" Looking Glasses made only at Venice.
1319 Paper first made of linen rags.
1330 Gunpowder invented by Swartz, a Monk of Cologne.
1331 The art of Weaving by common looms introduced into England.
1340 Blankets first made in England.
1344 The Madeira Islands discovered by Macham, an Englishman.
" Gold coined in England.
1347 The Admiralty Court established in England.
" The University of Cracow founded.
1348 University of Prague founded.
1349 The order of the Garter instituted in England.
1351 Wire invented and made at Nuremberg.
1362 Law Pleadings in England carried on in English instead of French.
1365 Geneva College founded.
1380 Side Saddles first used in England.
" Playing Cards first invented in France.
1381 Bills of Exchange first used in England.
1383 Cannon first used by the English.
1390 Woollen Cloth first made in England.
1404 Hats first made at Paris.
1410 Painting in oil color, said to be invented by John Van Eyck, at Bruges.
1420 The Island of Madeira discovered by the Portuguese.
1423 Engraving on Wood invented in Flanders.
" Engraving on Metal invented.
1430 Printing invented about this time, at Harlæm.
1450 University of Glasgow founded.
1454 Figures in Arithmetic first used in England.

[To be continued.]

FINE ARTS.

LECTURES

DELIVERED TO THE STUDENTS OF THE NATIONAL ACADEMY OF DESIGN,

ON HISTORICAL PAINTING.

By William Dunlap.

LECTURE I.

Young Gentlemen,—Having consented to address you on the subject of Historical Painting, I have avoided any recurrence to the lectures of Reynolds, Opie, and others, because these authors are, or ought to be, in your hands; and because I thought I could do you more service by such hints as my own experience, and the recollection of former studies, might suggest.

The mode of instruction, by lectures, has been adopted very generally in Europe, particularly on the continent; and is becoming fashionable here. It has many advantages, and is a source of improvement to the lecturer, as well as the student. If I produce no other effect upon my hearers than that of turning their attention to higher authorities, and better instructors, I shall have done some service to the cause of the fine arts.

The cultivation of the Fine Arts must be considered as one of the best modes of encouraging and strengthening the loftiest propensities of our nature. It might, at first view, appear that the arts called useful, those immediately necessary to life, are more valuable than poetry, sculpture, music, or painting; but for all the higher purposes of man's existence, literature and the fine arts are placed, in relation to the arts by which subsistence is obtained, in the same comparative rank that the mental powers hold to the physical. Man cannot exist without his corporeal powers and the arts which support them; but he would not *be man* if deprived of those intellectual powers which are his boast and happiness; or, of the fine arts, the fountains from which they are nourished.

We only profess to study the Arts of Design; and one of those alone, Painting, is our present subject. The art of painting, from the difficulties attendant upon its practice, and the effects it is capable of producing, ranks among the first of the fine arts. In its noblest branch, historical composition, it is the most impressive commentary upon the poet and the historian; or, it may precede them, and record in colors those events, or those suggestions of the imagination, which they would have told by words. It presents,

upon a single page, and at one view, the personages and events of history; and while it excites good and pleasurable emotions, prompts to those exertions which end in future happiness.

Painting must have been unknown to man in his savage state. In the arts of design, men begin with those that are necessary; they then seek the beautiful; and, according to some writers, they are next prone to the superfluous and exaggerated. Sculpture preceded painting. The first effort in the imitative arts is to model in clay, the next is to cut in wood, and then in stone.* The rude efforts of the aborigines of our continent go to prove this. We see their attempts at modelling and sculpture, but we find no attempt at drawing or painting. I make no exception in respect to the Mexican feather pictures; they were a species of hieroglyphical writing—and the Mexicans had emerged from the first stages of society. To model, requires a simple idea of a thing; to paint, requires a variety of knowledge almost endless.

Far be it from me to slight the noble art of sculpture, to which we owe so much. Sculpture has given us the most perfect models of beauty, and it i by the study of the antique, as left to us in statuary, that our minds are filled with images of grace, dignity, and sublimity; still it must be allowed, that to represent the combined beauties of nature, near to the eye, or afar off, motionless, or in action, with all their varied tints of light and color, on a flat surface, is an achievement of more difficulty than any the sculptor has to encounter, and requires more knowledge, and is capable of greater effects, either for pleasure or instruction.

Painting may be defined the art of representing on a flat surface, by means of lines and colors, objects of every shape and description, the very *reverse* of flat; and of making those objects, although all equi-distant from the eye, appear to be at various distances, some near, some far off, at the will of the artist. Or, in other words, the art of representing upon an opaque, perpendicular substance, a scene, historical or imaginary, as it would, if real, appear to a spectator through a transparent plane.

If a frame is placed perpendicularly between you and any object, and a transparent substance is stretched within it, so that you may see whatever is behind the frame; it is certain that you can, upon that transparent substance, draw the outline of the object seen through it, whether round, square, or irregular. So likewise you can trace an accurate outline of a shadow falling from any object upon a neighboring wall. Thus we are told the enamored Grecian maid drew the profile of her sleeping lover, and pointed the way to drawing and painting, yet unknown to her countrymen.

This is the beginning of a picture. You have lines upon a a flat surface,

* Ivory and the precious metals were used. The colossal statue of Minerva, by Phidias, was of ivory and gold.

but *all* is yet flat. The outline of a globe is no more than a circle. It is by light and shade that it becomes a ball. This is the second step in the art. The third is coloring. By adding color to the circle, which has been made by light and shade to swell into a globe, it becomes a billiard ball or a grape; a leaden bullet, a cannon ball, an apple, a cherry; or a shining mass of burnished gold.

Let us recur again to the frame with the transparent substance, on which may be traced any object that can be seen through it. You may, behind this frame, view a landscape entire, with its houses and trees, its rivers and hills. If the outlines of all these objects are traced on the transparent plane, as seen, they must have their true forms, they must be in their proper places, and of the relative sizes which the laws of perspective would assign to them; the nearer objects large, the more distant small and smaller. Thus the landscape painter has the outline of a picture. And the portrait painter may be aided by similar contrivances. But who shall place behind the frame, and give to the artist's eye the mighty events of history? What power shall bring to the painter's view the Saviour of the world healing the sick: or teaching the ignorant; or feeding the hungry; or bound before Pilate; or praying for his enemies on the hill of Calvary? With the crowds of sinners and sufferers; of disciples and persecutors; warriors, women, and children; individuals of all nations brought together by the conquering sword of Rome; the European, the Asiatic, and the African, in their true and appropriate costumes, as seen two thousand years ago? It is clear, that no power can place behind the transparent plane such glorious objects for the painter to trace or copy. The artist cannot represent, by mechanical effort or contrivance, the deeds of ages past, or the persons of those who have influenced all the events of the world from the time of their existence to the present hour. The painter, like the poet, must be of imagination "all compact." The words of the immortal dramatist, are as applicable to the one as the to other; and we may say, when speaking of Raphael, Rubens, Poussin, West, and many others,

> "The" *painter's* "eye in a fine phrensy rolling,
> Glances from heaven to earth, from earth to heaven;
> And as imagination bodies forth
> The forms of things unknown," *the graphic art*
> *Upon the outstretch'd cloth each image stamps*
> *In Nature's dyes*, "and gives to airy nothing
> A local habitation and a name."

But although imagination must reveal to the painter those wonderful and glorious scenes which were exhibited long since by heroes and sages, it is only by intense study, accumulated knowledge, and persevering industry, that he is enabled to give to present and future generations a just representation of past events; to trace, and fix on the blank canvass, the perpendicular plane before him, the evanescent forms which the great magician, imagination, has conjured up to his enraptured view. The task is an ardu-

ous one, my young friends, and you will meet with difficulties and discouragements at every step; but the energy of genius, and the consciousness of good intention, will enable you to surmount every obstacle.

The time is past, when those who taught the lessons of benevolence were tortured and put to death; but you will be tortured by hearing your works abused, and yourself accused of presumption or plagiarism. You must expect toil, and poverty, and "the spurns which patient merit of the unworthy takes."

I do not hesitate to apply to you the characteristics of patience and merit. If not meritorious as men, you will be unworthy of distinction as artists; and you must possess the quality of patience, or you will not have the persevering industry that alone can crown you with success.

To make use of the accumulated knowledge which the historical painter's study and industry must supply him with, so as to present to others, with truth and attractive effect, the visions of his "mind's eye," is what we will call the art of historical composition. An art which may claim the denomination of invention—the highest effort of the genius of man.

The term composition is technically applied, in painting or drawing, to the representation of one object, as well as to the combined representation of many. There is composition required in painting an article of household furniture, or of dress. In portrait painting, still more is required, although for a single head, or bust. The graceful turn of the neck, play of the features, disposition of the hair, all require the art of composition. When a whole figure is to be painted, still more knowledge, skill, taste, and judgment, is required. When several figures are to be grouped, the difficulties are increased, and, to overcome them, more power must be exerted. But when many groups are to be combined to represent one glorious event in history, the art of composition is tasked to its utmost, and success is one the greatest triumphs which can be attained in the most difficult, most impressive, and most sublime of the fine arts.

In a great and complicated historical composition, however many the groups, every group, and every figure in each group, ought to be so employed as to increase the interest in the event represented. This is called *unity of design*. When the death of a hero is the subject of the picture, every figure should be occupied *with*, every expression centered *in*, the suffering and conduct of the principal. This is finely exemplified in the death of Wolfe, by West, and the death of Montgomery, by Trumbull. When an action of the author of the Christian religion is the subject chosen by the painter, this rule seems to be so imperative, that any deviation from it must necessarily be a fault. Every figure, in such a subject, should have an expression and attitude differing from the other; each should be employed characteristically; and all must be combined to give interest to, by showing their interest in, the one all important object who soothes their sufferings, and points the way to happiness.

In the highest branch of the art of historical painting, the moderns have gone far beyond the ancients. Notwithstanding the praises and descriptions given of the works of the Greek painters, by their cotemporaries, or by those who had seen their pictures, there is good reason to believe that they were very lame compositions. The eulogium of Pausanias, on the compositions of Polygnotus, particularly the descent of Ulysses to the infernal regions, proves that the groups were isolated, and that the artist was ignorant of the fundamental principle of composition, which I have stated to you. I have never seen any proof that the artists of antiquity, of whom the Greeks were the best,—as far as our knowledge yet extends,—had arrived at that degree of skill, in the composition of a single group, which would entitle them to appear as rivals to the moderns. I have, in my possession, a much praised group, found in Herculaneum, representing the first labor of Hercules. This picture agrees so well with Pliny's description of a painting by Zeuxis, on the same subject, that it is supposed to be a copy from that master. If compared with the painting of Reynolds, on the same subject, it sinks into an object not merely of indifference, but contempt. In short, all that has come down to us of their works, serves to prove that their knowledge of composition went little further than that which they would gain by imitating, or drawing from, the works of their sculptors. They attained a knowledge of the proportions of the human figure. Both painters and sculptors had constantly before them the most perfect forms for strength, agility, and beauty. Whether the object before them was naked, or covered by flowing drapery, their senses were impressed with images of loveliness, grace, and dignity. There can be no doubt that the sculptors of Greece had become skillful draftsmen, before they attained that perfection which we see in their works; and the painters appear to have gone no further, in composition, than the imitation of the statues, and *alto*, and *basso relievos*, which the sculptors produced. They added coloring to the drawing of their masters, and their skill in managing colors was admirable. They combined the pigments they used, with a preparation of wax, called punic wax, which, though not always requiring fire, or heat, in the application, gave to their mode of painting the term *encaustic*. The effects they produced are, to this day, viewed with admiration, in their works found after being, for ages, entombed in the houses, theatres, and temples of the cities buried by the fires of Vesuvius. The leaders in the arts of design, the sculptors, had ingeniously contrived to represent historical events, by arranging figures, in succession, on a wall, or other flat surface, and raising them in alto, or basso relievo; the painters, in *this*, followed their masters; and the utmost extent of their skill, in composition, went no further, or, at most, very little further, than to tell their stories by arranging a number of simple figures in a line.

That perfection of the art, to which modern painters have attained, in foreshortening, grouping, perspective, and that combination of figures and groups, which makes every portion of a great picture tend to one purpose,

—as far as I have obtained knowledge on the subject,—the ancient painters were extremely deficient in, if not altogether ignorant of. When we shall be enabled to judge, from the works of Mons. Champolion, of the extent to which the Egyptians had carried the art of composition, a new field of speculation, and, I hope, of instruction, will be opened to us. There is no reason to doubt that this enlightened and adventurous gentleman has made important discoveries, both in regard to science and the arts. He has found a key to the long locked up hieroglyphics, and, of course, to the history and philosophy of Egypt.* He assures us that the figures, both sculptured and painted, of the most remote antiquity, discovered by him, are in the highest style of design; such of us as shall live to see the result of his researches, will be in state to pronounce upon the comparative merits of ancient and modern art, having testimony before them which is now wanting.

I purpose, when I next address you, to pursue the subject of historical composition, by remarks on *chiaro oscuro* coloring, costume, and perspective, as connected with that branch of the arts of design.

[The second Lecture will appear in our next.]

HISTORICAL PAINTING.

We have enjoyed the pleasure of viewing (though in an unfinished state) a historical painting, now in progress, by Mr. Dunlap, which commemorates one of the most important events of the late eventful year, the Revolution in France. The artist has selected for his pencil that moment when, after a series of bloody conflicts between the royal troops and the citizens, the latter, headed and cheered on by a young cadet of the Polytechnic school, made a rush over the bridge leading across the Seine to the Louvre, forced the troops to retire into that building, which was, soon after, taken possession by the citizens. We have no room, at present, to say more of the picture than that we think the artist has done justice to the noble subject.

CLINTON HALL.

We have taken some pains to procure an engraving of this building, and now take equal pleasure in presenting it to our readers, as a specimen of the arts, highly creditable to the artists, Mr. Davis, by whom the drawing was made, and Messrs Balch, Stiles, Wright & Co., who engraved it..

* I do not enter into the dispute between Dr. Young and M. Champolion; if the latter fulfils the expectation he has raised, we may compare him to our Fulton, as having made that useful which others had given up as hopeless.

NATURAL HISTORY.

THE AGAVE.

The name of Agave,* or admirable, is well applied to a group of plants, which are as remarkable for the beauty and splendor of their flowers, as for the extraordinary magnitude by which some of them are distinguished. The largest herbaceous plant, with respect to its height, belongs to this genus, and sends up a stem which is crowned with branches of flowers, as large as the spreading top of an ordinary tree. In the name which is selected for this race of vegetable wonders, the classic reader will not fail to recognize one of the expedients which botanists, of the Linnean school, have recourse to, for the purpose of discriminating the various groups, or sections, which are found in the vegetable kingdom, and which are as necessary to be distinctly and appropriately named, as the divisions of the animal tribes.

Agave is a familiar name among the mystic personifications in the mythology of the ancients. One of them was a beautiful nymph among the aquatic divinities, the Nereids, or mermaids, (the only genuine kinds whose fabulous origin, and shadowy existence, have ever been truly acknowledged.) Another was enrolled in that class of independent and majestic beauties who spurned the control or the assistance of the sterner sex, the Amazons; and the tragic adventures of a third Agave, the daughter of Cadmus, have been described in the metamorphosis of Ovid. The beautiful name, as well as the imaginative qualities for which these mythological personages were distinguished, might be transferred, with some fanciful propriety, to this extraordinary assemblage of animated nature, whose external splendors are only less interesting than their useful properties.

One of this genus, the *Agave Virginica*, is a native of our southern states, being often found in Virginia, and as far south as Florida and Louisiana. From its fragrant flowers, it is a desirable ornament to the gardens, and will sustain the climate of this neighborhood.

The *Agave Cubensis*, Jacq., *Mexicana* of Lamark, is a species indigenous to the island of Cuba, Mexico, and the adjacent regions. This species has been confounded with another, and is sometimes mentioned as the Maguey of the Mexicans, which it resembles in form, although much smaller. It has the same peculiar property which distinguishes, indeed, all the tribe, in a greater or less degree, of furnishing strong, tough fibres from its leaf, which are useful for many purposes in the arts. The leaves are produced from the roots, and spiny, though less thick than those of the following one, and the stem, or scape, arises to the height of about fifteen feet.

The most singular species of the genus, is the *Agave Americana* L. or the Maguey, as it is called among the aboriginal Mexicans. This plant is often quoted as the giant of the herbaceous creation, exceeding, in its overtowering height, any other species hitherto discovered. It is not uncommon for them to reach the height of twenty or thirty feet. It is not less interesting from the many important uses to which it is converted, in domestic economy, and in the arts. It is only in its native climate that it arrives at perfection;

* From αγαυη admirabilis.

but attempts to reduce it to cultivation have been made in many places where the climate is at all adapted to its preservation. In the south of Europe it is said to be much used, for the purpose of making fences, for which purpose it is admirably suited, from its strong spinous leaves, which are absolutely impenetrable. In these latitudes, however, it never, or very rarely, flowers. A specimen was cultivated, a long time, at Versailles, in France, and flowered, at length, after being carefully attended to for sixty-two years. It is employed, also, in Cuba, for the same purpose of fencing.

From the cut we have given of it, it will be seen that it is a stout plant, having no stem, properly so called. The leaves are radical, numerous, thick, elongated, channeled, spiny on their borders, and terminating in a strong point. The scape, or long flower-bearing stem, proceeds from the root, to a great height, and terminates in a panicle, like a pyramid, the branches being covered with large, yellowish-green flowers. The stamina, and styles, are much longer than the calyx of the flower. These flowers are, for some time, in a state of preparation, and the extreme rapidity with which they are evolved, is such that it may be perceptible to the eye. The extraordinary size and beauty of this plant are secondary considerations, when its utility, for many objects, is observed. According to Raynal, all the parts of it are serviceable, for some particular purpose. The roots serve to make cords; the scapes, or stem, produce a kind of wood; their spines may be used for nails or pins, and the leaves are good for covering roofs of houses. The fibres, of which the skeleton or frame of the leaves is composed, furnish a thread to make ropes and cords, a coarse kind of linen for bagging, twine, &c. To procure the thread from the leaves, they are bruised under a roller, or otherwise, and by washing, all the fleshy, juicy parts, are removed, and what remains is the fibre, which is combed and prepared for the various purposes intended. The hemp, which is produced in this manner, forms a valuable article in commerce, and large quantities are annually sent to various parts of the world, particularly the United States and the West India islands, for coffee bagging, and similar uses. From the pita, or twine, ropes are made, which is much used for cordage in vessels. It is, however, less pliable than hempen ropes, and is more liable to be affected by changes of weather; otherwise, it is extremely tough and durable.

The juicy nature of the Maguey, renders it one of the most important plants which are cultivated in the warmer latitudes of South America. The natives, particularly the lower classes of Mexicans, derive from it their favorite beverage, which they call *pulqué*, and to obtain which, the Maguey is cultivated in large plantations. Mr. Ward, in his interesting account of Mexico, has given, at length, the mode of collecting the pulqué; and from him we have derived the information respecting the manner of treating the plant for this purpose. It is in the states, he observes, of Puebla, Mexico, and Guanajuata, and a small part of Valladolid, that the principal plantations of Maguey are found. The most celebrated are those in the vi-

cinity of Cholula, and the Llanos de Apam, between the towns of Huamantla, Tlascala, Apam, and the capital; the valley of Toluco is likewise famous for its pulqué, which is drawn from the extensive Maguey-grounds in the vicinity of Lerma; but, in general, although the plant is found wild in every part of Mexico, no attempt to extract pulqué from it is made, except in the districts which are within reach of the two great towns of La Puebla and Mexico, where, amongst the lower classes of the inhabitants, the consumption is enormous. Before the revolution, the revenue derived from a very small municipal duty exacted on the pulqué, at the gates of these towns, averaged $60,000, and amounted, in 1793, to $817,739.

The Maguey, or aloe, from which pulqué is extracted, differs but little, if at all, in appearance, from those which abound in the south of Spain, and which are known, though of much smaller size, in England. Its growth is slow, but when arrived at maturity, its leaves are usually from five to eight feet in length, though some considerably exceed these dimensions.

In the plantations, the plants are arranged in lines, with an interval of three yards between each. If the soil be good, they require no attention on the part of the proprietor, until the period of flowering arrives, at which time the plant first begins to be productive. This period is very uncertain: ten years, however, may be taken as a fair average; for in a plantation of 1000 Agaves, it is calculated that 100 are in flower every year. The Indians, acquainted with the plants, know, by certain signs, almost the very hour at which the stem or central shoot, which is destined to produce the flower, is about to appear, and they anticipate it by making a deep incision, and extracting the whole heart or central portion of the stem, (corazon,) as a surgeon would take an arm out of the socket, leaving nothing but the outside rind, which forms a natural basin or well, about two feet deep, and one and a half inches in diameter. Into this the sap, intended by nature for the support of the gigantic central shoot, is continually oozing in such quantities that it is found necessary to remove it twice, and even three times, in a day. In order to facilitate the operation, the leaves on one side are cut away, so as to admit of a free approach; an Indian then inserts a long gourd, the thinner end of which is terminated by a horn, while at the opposite extremity a small square hole is left, to which he applies his lips and extracts the sap by suction.

This sap, before it ferments, is called aguamiel, or honey-water, and merits the appellation, as it has a very sweet taste, and none of that disagreeable odor which is afterwards so offensive. From the plant, a small portion of it is transferred to a building, prepared for the purpose, where it is allowed to ferment for ten or fifteen days, when it becomes what is termed madre, pulqué, which is distributed in very small quantities amongst different skins and troughs, intended for the daily reception of the aguamiel. Upon this it acts as a kind of leaven; fermentation is excited instantly, and in twenty-four hours it becomes pulqué, in the very best state for drinking:

the quantity drawn off each day is replaced by a fresh supply of aguamiel, so that the process may continue during the whole year without interruption, and is limited only by the extent of the plantation. A good Maguey yields from eight to fifteen quartillos or pints of aguamiel in a day, the value of which may be taken at about a real, and this supply of sap continues during two, and oftentimes three, months. The plant, therefore, when about to flower, is worth ten dollars to the farmer, although, in the transfer of an estate, the Maguey de Cortes (ready for cutting) are seldom valued, one with another, at more than fifty dollars. But in this estimate an allowance is made for the failure of some, which is unavoidable, as the opportunity of extracting corazon, if performed too soon or too late, is equally unsuccessful, and destroys the plant altogether. The cultivation of the Maguey, where a market is at hand, has many advantages, as it is a plant which, though it succeeds best in a good soil, is not easily affected either by heat or cold, and requires little or no water. It is propagated with great facility; for although the mother plant withers away as soon as the sap is exhausted, it is replenished by a multitude of succors, which spring from the old root, and grow well when transplanted.

The only drawback is the time that must elapse before a new plantation can be rendered productive, and the uncertainty with regard to the time of flowering, which varies from eight to eighteen years; but the Maguey grounds, when once established, are of great value, many producing a revenue of from $10,000 to $12,000 per annum.

The natives ascribe to pulqué as many good qualities as whiskey is supposed to possess in Scotland. They call it stomachic, a great promoter of sleep, and an excellent remedy in many diseases. It requires a knowledge of these good qualities to reconcile a stranger to that smell of sour milk, or slightly tainted meat, by which the young pulqué drinker is usually disgusted; but if this can be surmounted, pulqué will be found both a refreshing and wholesome beverage; for its intoxicating qualities are very slight, and as it is always drank in a state of fermentation, it possesses, even in the hottest weather, an agreeable coolness. It is found, too, where water is not to be obtained, and even the most fastidious, when travelling under a vertical sun, are then found to admit its merits.

It is only to be met with in perfection near the places where it is grown, as it is conveyed to great towns in skins on asses, a tedious process, in the course of which the odour increases while the freshness is lost.

A strong sort of brandy, called Mexical or Aguadiente de Maguey, is likewise extracted from the Agave, of which there is great consumption in the country. Nor is the utility of the plant confined to this; the aztec was prepared from its leaves, which was the paper on which their hieroglyphics were written—pieces of which, of various thickness, may be found at the present day.

THE PELICAN.

The power of flight which the Pelican possesses, enables him to extend to a very considerable distance, and hence he is a general inhabitant all over the world. The remarkable habits and structure of this race of birds, render their history interesting. Two species are known to inhabit our coasts; the white, which is rather rare, and only accidentally met with on the coasts of the middle states, and the brown one, which is more common, and is often found in the southern states, where it breeds. The white species (*Pelicanus Onocrotalus*) is sometimes taken, and has been known to breed, in a state of domestication. In the Tower of London, belonging to the Menagerie, a pair have been kept for this purpose, and in the accounts given of them, the peculiarities of the whole genus are embraced.

Linnæus united under the common title of Pelicans, the Cormorants, the Boobies, and several other birds, which differ from the typical species of the genus by many important characters, the chief point of agreement between them consisting in the form and extent of the membrane which unites the toes. The Linnean group has subsequently been raised to the rank of a family, and its component parts form several distinct genera, that which comprehends the true Pelicans, the genus Onocrotalus of Brisson, being characterised as follows. Their bill is of very great length, straight, broad, flattened above, and terminated by a slight hook; the lower mandible consists of two lateral branches, united at the point, and having interposed between them a membranous pouch, capable of very great dilatation; their four toes are enveloped to the very apex in the common membrane; their legs are short, strong, and maintain the body in a state of equilibrium, their lower part being entirely destitute of feathers.

With the exception of the quill-feathers of the wings, which are black, the plumage of the Pelican is, throughout, of an extremely light and delicate flesh color, varied only by occasional darker tinges. The head and upper part of the neck are clothed with a short down, except on the temples, which are naked and flesh colored; the upper mandible is of a dull yellow in the middle, with a reddish tinge towards the edges, and a blood-red spot on its curved extremity; and the pouch is of a bright straw color.

The Pelican is one of the largest water birds, considerably exceeding the size of the Swan, and frequently measuring from five to six feet between the extremity of the bill and that of the tail, and from ten to twelve between the tips of the expanded wings. Its bill is nearly a foot and a half in length, and from an inch and a half to two inches broad; and its pouch is capable of containing, when stretched to its utmost extent, two or three gallons of water. The quantity of fish which it sometimes accumulates, in the same serviceable repository, is spoken of as enormous. Notwithstanding their great bulk, and apparent clumsiness, the large extent of their wings, and the extreme lightness of their bones, which are so thin as to be almost transparent, enable these birds to rise to a lofty pitch in the air, to hover at a

moderate elevation, or to skim rapidly along the surface of the water, with as much facility as they dive into its depths in pursuit of their prey. They sometimes assemble in large numbers, and in this case are said, by Buffon, to act in concert, and to show no little skill in manœuvering with the view of securing a plentiful quarry, forming themselves into a circular line, and gradually narrowing the extent of the space enclosed, until they have driven the fishes into so small a compass as to render them a certain prey; when, at a given signal, they all at once plunge into the water and seize upon their terrified victims, filling their pouches with the spoil, and flying to the land, there to devour it at their leisure. This fishery is carried on both at sea and in fresh water.

They are found in nearly every part of the globe, but are of rare occurrence in the north of Europe. A pair which bred in the Tower of London, was obtained from Hungary. The nest was constructed, and three eggs were laid by the female, before the process of incubation began. She, it is observed, never quits her charge, but is fed by the male, who crams his pouch with double his usual allowance, and then proceeds to shovel her fair share into his partner's throat. It is in this manner, also, that the young are fed, the old bird pressing his full pouch against his chest, and contriving thus to disgorge a portion of its contents; an action which has, no doubt, given rise to the fabulous notion of the Pelican's feeding its young with its own blood. In fact, the appearance of the bird when in this attitude, with the bloody spot, on the end of its bill, closely pressed against the delicate plumage of its breast, may readily account for the prevalence of such an idea in the minds of superficial observers. The first traces of this fable are to be found in the writings of some of the early fathers of the church, and it was eagerly adopted by the heralds of later days, whose unbounded credulity was ever on the watch for the marvellous, in natural history more especially.

WATER ON MANHATTAN ISLAND.

A supply of wholesome water, for the use of the inhabitants of our city, has for a long time occupied public attention. Various plans to effect this purpose have been devised; some recommending the attempt to be made by boring or sinking wells in various parts of the city, and others proposing to establish communication with certain fresh water streams and reservoirs at some distance from the Island of New York. The corporation of the city, with a view of obtaining such information on the subject as could be gathered from a knowledge of the strata, rock-formations, and position of the Island, addressed the Lyceum of Natural History. A communication from the committee appointed to confer on this head with the corporation, has been made, and as a part of this report embraces much information on the Geology of our neighborhood, we shall present some extracts from that

part which treats of the source of the water found on the Island, and the quantity to be derived from it. The committee observe,

"The phenomena presented by springs or wells of water, have given rise to many intricate questions, exercising the ingenuity, and often deranging the speculations of Philosophers. It is only in more recent times, when the position and nature of rocks have been attentively studied, that this subject has been freed from the mystery and embarrassment in which it was formerly involved. Almost every spring or well of water on the globe (it is now ascertained) must be studied by itself, in order to understand thoroughly its source, and all the circumstances connected with its overflow. It fortunately happens, however, that on this Island, springs or wells of water are presented to us in the simplest form, and of these we shall now proceed to treat.

1. *Of the source of all the Water on this Island.*

The first and most important consideration, is the nature of the loose soil or earth on the surface, and the composition and arrangement of the rock beneath, upon which this earth rests. This Island consists (with the exception of a small portion near Kingsbridge) of a rock of a uniform nature. Immediately upon this rock is a bed of sand, which is of unequal thickness, and upon this sand and gravel the city is built. The rock is known by geologists under the name of gneiss, or stratified granite, and as it is among the lowest rocks ever found, it has been considered as the first created, and accordingly has been called a primordial or primitive rock. In whatever part of the world we dig, we may be sure, after passing through all other kinds of rock, (of which there are about fifty in number,) of arriving at last to a rock of the same nature with that which underlies this city. It frequently, however, happens that only a few rocks are found lying upon this gneiss, or stratified granite, and in many places it rises to the surface not covered by any other rock whatever. Upon such a denuded or uncovered rock stands the city of New York. The committee are not prepared to indicate the precise situation of the adjoining rocks, as the rivers conceal on each side their place of contact, and it would be requisite to enter into much geological detail to show their probable arrangement. With this preliminary explanation we are now prepared to enter upon the inquiry concerning the origin of the springs upon this Island. The only source of fresh water, is from the atmosphere, from which it falls in the form of rain, hail, and snow, having been previously carried up from the surface by evaporation. When the earthy and stony beds, or strata, are of a soft porous nature, and differ among themselves in their structure and composition, the rains soak through the more porous or spongy rocks, until its further course downwards, is finally arrested by the more compact ones. This is a matter of too common observation to be insisted upon, and explains why, in our researches for water, we are often compelled to dig to great depths; at the same time, an acquaintance with the structure and composition of rocks, should prevent us from perforating rocks, which, from their very nature and position, cannot be expected to furnish water. All the water which falls on this Island, is then first absorbed by the sand through which it trickles, until it meets with the solid rock, which it softens to the depth of a few feet, and then makes no farther progress. This sand, overlying the rock, is the recipient of all the water which falls on the surface. It is in this sand that all our wells are sunk, and we accordingly find, that where this bed of sand is not deep, water is met with (when any is present) at only a few feet from the surface. This rock is also free from metallic veins. Such veins are, however, sometimes found, but they are of rare occurrence and inconsiderable in size. Their presence, in a well sunk into this rock, is always known by the

state and appearance of the water. The two wells recently sunk into the rock in the rear of the City Hall, are instances of this kind, and others of a similar nature, might be adduced, if necessary. It has been urged by some persons, that water must be found in our rock, because mines, some of which are in a primitive rock nearly resembling this, are often filled with water. This water, upon examination, will be found to proceed from the more porous rocks above; or, when these rocks are wanting; from accidental fissure leading the water from above into the artificial cavities made by the miners. We have no data readily at hand to be enabled to state the amount of water raised from one of these mines, but it must be inconsiderable, when regarded as a source of supply for a population of 200,000 inhabitants. Even if it should be conceded that one of these mines furnished an abundant supply, it remains to be proved that our gneiss rock is penetrated with as numerous and as large mineral veins, and then it would be necessary to make excavations as extensive as in the mines alluded to.

"The *position* of rocks, is also a matter of primary importance in reference to the subject of springs of water. By position, is meant, the manner in which rocks are arranged with respect to each other and among themselves. Thus lime stone, of a particular kind, occurs in horizontal beds or strata, and many rocks are found nearly upright. The gneiss of this Island has its strata nearly vertical, or upright, and these are so closely united, that the separation is barely visible to the eye. It is not then from these crevices or partings that we are to expect a supply of water. We shall close our remarks on the nature of this rock, with the fact, that it is free from those natural cavities observed in some other stony strata.

"Let us now exaimne the nature of the earthy covering over the rock of this Island. We have said that this consists entirely of sand, and this may be verified over the whole Island. There are, however, at some places along the East River, extensive deposits of mud. At these places, the rock has not been elevated to its usual height, and of course has been a convenient receptacle for this deposit. At Manhattan Island, there has been observed, first, a deposit of sand, then a layer of mud, underneath this another sand bed, and, lastly, the usual rock. These facts are introduced here, (and many others might be cited,) not as having any important bearing upon the question, but as exceptions to the general rule, that the whole Island is covered by a bed of sand. We must again repeat, that all the water obtained from our wells, is derived wholly and exclusively from the atmosphere. We think it necessary to do this, as there is a very prevalent idea, that the salt water from our rivers penetrates through the sand and appears in our wells in the form of fresh water. Those who have adopted this opinion, are not aware that by no process of straining or filtration can salt water be rendered fresh. The saline ingredients are not like animal and vegetable matters, which are merely suspended in the water; on the contrary, they are chemically combined with the water, and can only be separated from it by chemical processes. No chemical process, which could produce this separation, is known to be going on under this Island.

"This theory of infiltration has been supposed to be confirmed, because on this Island fresh water is obtained as soon as we dig to the level of the tide. This may be briefly explained. The sand-bank resting upon the rock of this Island, is saturated or soaked to a certain distance from the rock with fresh water from the surface. This is surrounded on all sides by the heavy salt water, which acts as a barrier or dam, and hinders the fresh water from flowing off altogether. Hence, at places near this barrier, the wells, although fresh, rise and fall with the tide; for when the tide falls, the fresh water, thus hemmed in, must fall because its area is enlarged, and when the tide again rises this area is diminished, and the fresh water in the well accordingly rises.

"At places more remote from this barrier, these effects are transmitted, of course, so

slowly, that before a change of tide could affect a distant well, another change of an opposite character would be in operation. The very fact that we are obliged to dig through a comparatively dry sand until we reach the tide level, is a strong confirmation of the existence of this barrier. Instead, then, of supposing that our wells are furnished from the river, it would be more correct to say, that much of our fresh water is carried off into the river. The phenomena of fresh water springs in the beds of rivers are susceptible of easy explanation, as they occur in the neighborhood of this Island."

2. *Of the Quantity of Water on this Island.*

"The result of a series of meteorological observations, gives us annually a fall of water equal to thirty-six inches, and the surface of the Island is about twelve thousand acres. This gives us an annual amount of eleven thousand seven hundred and thirty millions, six hundred and twelve thousand gallons. But when it is proposed to ascertain the available amount of water, we must make the following deductions:

1. The loss by evaporation.
2. That portion which falls upon naked rocks, or into natural channels on the surface, and is carried off into the river.
3. That portion which is prevented from penetrating the surface by the intervention o artificial means, such as pavements and dwellings.
4. And lastly, we must deduct all that portion which, although absorbed by the sand, is not retained, because it lies above the tide.

"It is then evidently, in the present state of our knowledge, a matter of extreme difficulty, to offer any accurate estimate of the quantity of water, which, (after making these deductions,) would remain for the use of the city.

"This water, where the nature of the surface permits, forms ponds or basins of water, whose size depends upon the extent of surface of the ground, which slopes towards these natural reservoirs.

"Such reservoirs exist in various parts of the Island, but they are too limited in their drainage surface to be recommended as capable of affording any adequate supply. In the natural course of events, they would be surrounded by streets and dwellings, which would lessen the quantity, and seriously impair the quality of their water. This may diminish the regret which has often been inconsiderately expressed, since one of the largest of these natural basins, (the Collect,) has been filled up and built upon. At the period when this was open, there was no city above it; and the surface was in its natural condition, for imbibing and conducting the water to this basin. At present, pavements and dwellings oppose a barrier to the absorption of water, and the levelling of the hills has greatly affected the quantity and direction of its drainage."

ASTRONOMY.

THE SOLAR SYSTEM.

No study can be more sublime, more interesting, or more impressive, than that of astronomy :—the vast and magnificent bodies which are presented to our view,—their countless numbers,—their perfectly regular and harmonious movements,—the immensity of the space they occupy,—the prodigious force required to move them, and the inconceivable velocity with which they travel in their several orbits,—all present the most striking display of the power of HIM who made, who directs, who governs all things. Nor is the study of Astronomy less useful than it is interesting : it has enabled man to ascertain the figure and size of the earth, and to traverse the trackless ocean from one extreme of the globe to the other. Nor is this all :—it has disarmed the hydra-headed monster, superstition, of some of its terrors, by developing the true and natural causes of many events which, being previously involved in darkness and mystery, were viewed as wonders and portents of some terrible evils. Eclipses, which were once looked upon as visible signs of Divine displeasure, and which were consequently viewed with terror and dismay by mankind, are now predicted thousands of years in advance, with as much accuracy, as to time, place, and circumstance, as any event can be recorded after it has happened.

Astronomy is probably the most ancient of all the sciences known by men ; indeed, its origin is lost in the dim twilight of antiquity,—for, when history and tradition began to throw a doubtful light upon the affairs of the world, some knowledge of the heavenly bodies was then possessed by man. It is well established, that when Alexander the Great took the city of Babylony, Callisthenes collected the astronomical observations of the Chaldeans for 1903 years, and transmitted them to Aristotle, at the request of the king ; and it appears to be equally well established, that so early as the year 3102, before the Christian era, the Brahmins, of Hindostan, were as well acquainted with the length of the tropical year, and with the manner of calculating eclipses. The Egyptians, too, as well as the Chinese, claim to have possessed a knowledge of this science some thousands of years before the birth of Christ ; nor are these claims entirely without foundation, as it is admitted that, so early as the year 2752, before Christ, the emperor of China, Fohi, computed astronomic tables, and that from his time to about the year 480, B. C., the science of Astronomy was held in great veneration by the Chinese.

But, however ancient may have been the knowledge of Astronomy, the

true system of the universe was never suggested till the time of Pythagoras and Anaximander, disciples of Thales of Miletus; the latter devoted much time to the study of this science and first taught that stars were similar bodies to the earth, and that the earth was round. The doctrine of the rotundity of the earth, first broached by Thales, was advocated and domonstrated by Pythagoras.

But this philosopher advanced one step farther and taught that the Sun was the centre of the planetary system around which the earth and other planets annually revolved; and he also taught that in addition to this motion the earth revolved diurnally round its own axis. This system was revived by the celebrated astronomer, Copernicus, a native of Thorn in Poland, who explained and defended it in a work which he completed about the year 1530, but which, dreading the consequences of vulgar and ignorant prejudice, he did not present to the world till many years after. It has since received the sanction of Galileo, Kepler, and Descartes; and its truth has been fully established by the illustrious Newton and the learned Bernouilli, Bradley, Herschel, La Place, and other modern astronomers. It is now known by the name of the *Copernican*, or solar, system.

Of this system, the Sun is the centre, around which the several Planets revolve in the following order, namely: MERCURY, VENUS, THE EARTH, MARS, CERES, PALLAS, JUNO, VESTA, JUPITER, SATURN, HERSCHEL. These are called *primary* planets, in contradistinction from those which, while they revolve round the sun, are attached to, and revolve round, some one of these, and are therefore denominated *secondary* planets, or moons.

"The SUN is the largest body yet known in the universe. His diameter is 887,693 English miles; his circumference 2,800,000, and his bulk is above 1,400,000 times greater than the earth. Although the Sun be the fixed centre of the universe, he has been discovered to have a motion round his axis in 25 days 10 hours, and another round the centre of gravity of the planetary motions. The motion round his axis was discovered by Galileo, in the year 1611.

"When the Sun is examined through a telescope of a tolerable magnifying power, and a piece of dark glass interposed to prevent his rays from hurting the eye, a number of dark spots of various forms and magnitudes are frequently perceived on his disc. These spots are sometimes so very large as to be perceptible with the naked eye. The nature and formation of the solar spots have been the subject of much speculation and conjecture. Some Astronomers have affirmed that the Sun is an opaque body, mountainous, and uneven, like the Earth, and covered all over with a fiery and luminous fluid: that this fluid ebbs and flows after the manner of our tides, so as sometimes to leave uncovered the tops of rocks, or hills, which appear like black spots, and that the nebulosities about them are caused by a kind of froth. Others have imagined that the fluid which sends us so much light and heat, contains a nucleus, or solid globe, wherein are several volca-

noes which, like Ætna or Vesuvius, from time to time, cast up quantities of bituminous matter to the surface of the Sun and form those spots that are perceptible on its disc; and that this matter is gradually consumed by the luminous fluid, and then the spots disappear for a time, but are seen to rise again in the same places, when those volcanoes cast up new matter. A third opinion is, that the Sun consists of a fiery, luminous fluid, wherein are immersed several opaque bodies of irregular shapes; and that these bodies by the rapid motion of the Sun, are sometimes buoyed, or raised up to the surface, where they form the appearance of spots which seem to change their shapes according as different sides of them are exposed to our view. A fourth opinion is, that the Sun consists of a fluid in continual agitation; that, by the rapid motion of this fluid, some parts more gross than the rest, are carried up to the surface of the luminary, like the scum of melted metal rising up to the top in a furnace; and that these scums, as they are differently agitated by the motion of the fluid, form themselves into those spots that are visible on the solar disc.

"Amidst all these conjectures, we are still left in uncertainty; for there appears little in any of them to entitle it to a superiority over the other. In one particular they all agree; namely, that the Sun is either composed of, or surrounded by, some very powerful heating substance; but what that substance is, or how it is maintained, they are all at a loss to determine. Many experiments have been made to determine the heat of the Sun or the *intensity* of his rays, when concentrated in the focus of a lens, or by reflecting mirrors. Among these may be mentioned the experiments made by Dr. Harris and Dr. Desaguliers, with a mirror constructed by Mr. Vilette. It was three feet eleven inches in diameter and its focal distance was three feet two inches. A fossil shell was calcined by it in seven seconds; copper ore virtrified in eight seconds; iron ore melted in twenty-four seconds; talc began to calcine in forty seconds; a great fish's tooth melted in thirty-two and a half seconds; a silver sixpence melted in seven and a half seconds; a copper half penny melted in twenty seconds; tin melted in three seconds; cast iron in sixteen seconds; slate melted in three seconds; bone was calcined in four seconds. So powerful are the Sun's rays, when condensed by burning glasses, that it is said Archimedes set fire to the Roman fleet, at the siege of Syracuse, by a combination of these glasses; and Buffon, in the year 1747, constructed a reflecting mirror of 168 plane glasses, moveable on hinges, with which he set wood on fire at the distance of 150 feet, and melted lead at 145 feet."

THE PLANET MERCURY is the nearest to the Sun of any one that has yet been discovered, being only thirty-seven millions of miles from the great luminary. He is about 3224 miles in diameter, revolves round the Sun once in eighty-eight, and round his own axis once in twenty-four hours and five minutes. To an inhabitant of this Planet, the Sun would appear about seven times larger than to an inhabitant of the Earth, and his heat would

be about seven times greater than it is on the Earth. Mercury is seldom seen by the naked eye, being so near the Sun. Some Astronomers imagine they have discovered mountains on his surface, but Dr. Herschel could not perceive any with a telescope magnifying two or three hundred times.

Venus is the next Planet in order. It is sixty-eight millions of miles distant from the Sun, and revolves round him once in 224 days, and it also turns round its own axis in the space of twenty-three hours and twenty minutes. This Planet is known as the morning and evening Star, and is the most brilliant of all the Planets. Mr. Dick states that Venus can be seen with a telescope, every clear day, without interruption, during a period of 583 days, with the occasional exception of thirteen days, in one case, and only three in another,—a circumstance that cannot be affirmed by any other celestial body, the Sun only excepted. About twice in a century this Planet appears to pass over the Sun's disk; this is called its *transit*, the last of which happened on the 3d June, 1769; the next will take place on the 8th Dec., 1874. This Planet as well as Mercury, is supposed to have mountains on its surface, one of which has been estimated by Schroeter to be twenty-two miles in height.

The Earth, the next Planet in the solar system, revolves round the Sun once in 365 days, five hours, and forty-nine minutes, at the distance of about 95 1-2 millions of miles, and round its own axis in twenty-four hours. The diameter of the Earth is about 8,000 miles, and its circumference, at the equator, a little more than 24,000; were there no other motion of the Earth therefore than that of its diurnal motion, a person situated upon the equator, would move through space at the rate of more than 1,000 miles per hour; but in addition to this motion the inhabitants of this earth are carried with the Planet they inhabit, in its annual circuit round the Sun, more than one million three hundred thousand miles per day, or upwards of fifty thousand miles per hour! "That a globe of so vast dimensions," observes Mr. Dick, "with all its load of mountains, continents, and oceans, comprising within its circumference, a mass of two hundred and sixty-four thousand millions of cubical miles, should whirl around with so amazing a velocity, gives us a most august and impressive conception of the greatness of that Power which first set it in motion, and continues the rapid whirl from age to age!"

While the Earth moves round the Sun, the Moon is at the same time revolving round it, at the distance of 240,000 miles, each revolution being performed in twenty-seven days, seven hours, and forty-three minutes. She is much smaller than the Earth, being only about 2180 miles in diameter, and is supposed to revolve about her own axis in exactly the same time that she revolves round the Earth, thereby always presenting the same surface to an inhabitant of this Planet. When examined with a telescope, the Moon's surface appears to be variegated with innumerable mountains, vallies, and plains;—some of these mountains are of great height, and others appear to be volcanic; but no seas or oceans have yet been discovered upon her sur-

face. This Planet, as well as all others, is supposed to be inhabited by sentient beings:—indeed, it would be derogating from the wisdom of the Great Architect of Nature to suppose that such a body of matter should be placed in the heavens merely to afford occasional light to the inhabitants of this Earth; as well may the inhabitants of the Moon, if such there are, suppose the Earth designed solely to afford them light, (as it actually does, in a degree thirteen times greater than are derived from the Moon,) during their long, and what must otherwise be, dreary nights.

The Planet Mars, the next in succession to the Earth, is 4189 miles in diameter, 144,000,000 of miles from the Sun, and revolves about him in 686 days, and 22 hours: this Planet also performs a revolution round its own axis in 24 hours and 40 minutes. Mars, viewed by us, has a fiery appearance that is owing to the density of his atmosphere, which is also said to be very extensive; for a beam of white light, passing through any dense medium, loses a part of its violet, or least refrangible rays, and it is more or less red in proportion as the medium is more or less dense. Hence the appearance of the clouds, and the color of the Sun and Moon in the morning and evening. At his nearest approach to the Earth, Mars is only fifty millions of miles distant from us; but at his greatest distance, he is about 240 millions of miles from the earth, and consequently his size appears to vary, being apparently twenty-five times larger at one time than at another.

The Planet Ceres. Between the orbits of Mars and Jupiter, four Planets, of much smaller dimensions than those that were known to the ancients, have been discovered, since the commencement of the present century: the first of these, Ceres, was discovered on the first day of January, 1801, by Mr. Piazzi, at Palermo in Sicily. It is of a ruddy color, and surrounded by a large, dense atmosphere. It is 1624 miles in diameter, 260 millions of miles distant from the Sun, and revolves about him once in four years and seven months.

The Planet Pallas was discovered on the 28th of March, 1802, by Dr. Olbers of Bremen. The diameter of this Planet has not been very accurately ascertained, but is estimated about 2000 miles: it is 266 millions of miles from the Sun, and revolves round him in the same time that Ceres does, namely, four years and seven months. It is surrounded with an atmosphere about 400 miles in height, though not so dense as that of Ceres.

The Planet Juno. Next in order of the new Planets, is Juno, discovered by Mr. Harding, at Bremen, 1st Sept., 1804. Its mean distance from the Sun is 253 millions of miles, its diameter 1425 miles, and it revolves round the Sun once in 4 years, 128 days. This Planet is distinguished from all others by the great eccentricity of its orbit,—its greatest distance from the Sun being 316 millions of miles, and its least distance only 189 millions.

The Planet Vesta appears like a star of the fifth or sixth magnitude, and may be seen with the naked eye, its light being very white and very

intense. It was discovered on the 29th of March, 1807, by Dr. Olbers, who had been led to believe that another Planet must exist, though not yet known, intimately related to, or connected with the three last discovered, and that this Planet must be situated near the constellations, Virgo, or Pisces. He accordingly examined all the small stars in those constellations, thrice a year, till his labors were crowned with success. Vesta is 225 millions of miles distant from the Sun, and completes its revolution round him in three years and 240 days. Its diameter is not yet known, but it is supposed to be about the same as that of Pallas and Juno. The four last described Planets have been supposed by Astronomers, particularly by Dr. Olbers, to be fragments of a Planet that once revolved between Mars and Jupiter, but which has been burst asunder by some immense irruption: it was this idea that induced Dr. Olbers to look for another new Planet in that part of the heavens where he at length discovered Vesta.

The Planet Jupiter, the next in succession, is distant from the Sun 490 millions of miles, and performs its revolution round him in 11 years, 317 days, and 14 hours, moving at the rate of 29,000 miles an hour. This Planet is the largest in the system, being 89,000 miles in diameter, or about 1400 times larger than the Earth. It completes a revolution around its own axis in nine hours and fifty-five minutes; consequently a person situated upon its equator would be carried round at the rate of 28,000 miles per hour. In looking at Jupiter through a telescope, he appears to be surrounded by several belts or bands, which cross his disk. These belts are variable both in number and appearance, and are supposed by some to be clouds or openings in the atmosphere; by others they are thought to be caused by great physical revolutions which are going on in that Planet. There are four moons, or satellites, attendant upon this Planet, which were discovered by Galileo: these supply its inhabitants with that light of which their great distance from the Sun would otherwise deprive them.

The Planet Saturn is 79,042 miles in diameter, 900 millions of miles from the Sun, and revolves round him once in 29 1-2 years. The revolution round its own axis is completed in ten hours and sixteen minutes. This Planet is distinguished from all others, by two large luminous rings, by which he is surrounded: these rings are concentric, the inner one being considerably broader than the outer; both are detached from each other, as well as from the Planet, though carried along with him in his circuit round the Sun. Besides these luminous rings, Saturn is attended by seven moons, which supply him with that light which his immense distance from the Sun prevents him from receiving from that luminary. Five of these moons were discovered by Huygens and Cassini: the sixth and seventh were discovered by Herschel, in 1789, by means of his large reflecting telescope. The surface of Saturn is diversified, like that of some other Planets, with dark spots and belts, and it was by these spots that Dr. Herschel ascertained the time in which he performed a revolution round his own axis.

THE PLANET HERSCHEL. The most distant of all the Planets in the solar system that have yet been discovered, is Herschel, known also by the names of *Uranus*, and *Georgium Sidus*. This Planet was discovered by the celebrated Astronomer, Dr. Herschel, in honor of whom it has received its name, on the 13th of March, 1781. Its distance from the Sun is 1800 millions of miles, or about nineteen times greater than that of the Earth from the Sun. It is about eighty times larger than the Earth, its diameter being 35,000 miles; and it requires eighty-three years to complete a revolution round the Sun, though it moves at the rate of 15,000 miles per hour. Were the degree of heat which is felt on the surface of any Planet proportioned to its distance from that body which we consider as the great source of heat and light, it would appear to us impossible that any being could exist, either on the Planet Mercury, which is the nearest the Sun, or on the Planets Jupiter, Saturn, and Herschel, and particularly the latter, which is so remote as almost to be out of reach of solar heat; yet, we cannot doubt that these immense bodies are the abodes of sentient beings, whose constitutions are adapted to the habitation provided for them by Him who has created nothing in vain, and who tempers the blast to the shorn lamb.

The Sun, as seen from the Planet Herschel, must appear of about the same size as Venus appears to us, and the light which an inhabitant of that Planet derives from the great luminary, is 360 times less than it affords an inhabitant of the Earth. The want of this light is in some degree compensated by six moons; though even with these, constituted as *we* are, we should find ourselves quite in the dark on that Planet

Although the Planets we have briefly described, are all that are now known, it is not improbable that, as man goes on from one improvement to another in the arts, telescopic instruments may yet be made by which other Planets may be discovered, not only within the orbits of some that are now known, but even beyond the present known bounds of the planetary system. But whether this be the case or not, we feel well assured that "to explore more extensively the region of the starry firmament," to investigate the wonderful works of nature, and to learn more of the admirable perfection of those laws by which her operations are controled, will constitute a part of our employment "during an indefinite lapse of ages in a higher sphere of existence."

THE FIXED STARS. Nothing affords a more just conception of the power of the Deity, and the magnificence of his works, than the contemplation of the heavens,—the number, magnitude, and splendor of those luminous bodies which are scattered through immeasurable space, and which have as yet baffled every effort of science to determine either their size or distance. Compared with these bodies, this earth which, considered by itself, we look upon as an immense body of matter, sinks into insignificance, and dwindles to a mere spot, scarcely discernible in the great chart of the universe. It is almost impossible to convey any adequate idea of the distance

of these stars from us, as it is difficult, nay, perhaps impossible, for our minds to conceive of a distance so great. The nearest fixed stars have been computed, by the ablest Astronomers, to be not less than 7600 millions of miles from this earth. Now, if a cannon ball, travelling at the rate of 1200 miles an hour, had been started at the creation of the world, according to the Mosaic account, it would at this time only have travelled about the *one hundred and thirtieth part* of this distance. Although light is known to travel at the rate of about *twelve* millions of miles per minute, yet the celebrated Huygens, one of the most distinguished Mathematicians and Astronomers of the seventeenth century, carried his speculations on this subject so far as to believe it not impossible that there are stars at such inconceivable distances that their light has not yet reached the earth since the creation.

The fixed stars have been arranged into classes, or orders, according to their magnitude; the largest being called stars of the first magnitude; the next largest, stars of the second magnitude; and so on, to the sixth class, which are the smallest visible to the naked eye. They have also been classed into constellasitions or asterisms, which are assemblages of contiguous stars, and which received their names from certain animals, or objects which, taken together, they were supposed to represent. When the stars were thus classed and named, is a question not easily determined, though the prevalent opinion is that it was done by shepherds of Egypt, who, as "they watched their flocks by night" on the plains of that interesting country, were naturally led to the observance of the heavens,—to watch the luminous orbs of night,—to give them names, and finally to arrange them into constellations, to each of which they gave, as we before observed, the name of the object that the figure of the constellation was supposed to resemble.

In regard, however, to the names given to the twelve constellations of the ecliptic, commonly called the twelve signs of the zodiac, a different and perhaps a more rational account has been given. These constellations are the following, namely: *Aries*, the Ram; *Taurus*, the Bull; *Gemini*, the Twins; *Cancer*, the Crab; *Leo*, the Lion; *Virgo*, the Virgin; *Libra*, the Balance; *Scorpio*, the Scorpion; *Sagittarius*, the Archer; *Capricornus*, the Goat; *Aquarius*, the Water-bearer; and *Pisces*, the Fishes.

"As these twelve signs," observes a writer on this subject, "answer to the twelve months of the year, it is a very probable conjecture that the figures under which they are represented are descriptive of the seasons of the year, or months, in the Sun's path; thus, the first sign Aries, denotes that about the time the sun enters into that part of the ecliptic, the lambs begin to follow the sheep; that the sun's approach to the second constellation, Taurus or Bull, is about the time of the cows bringing forth their young. The third sign, Gemini, was originally two kids and signified the time of the goats bringing forth their young which are usually two at a birth, while the former, the sheep and the cow, com-

monly produce only one. The fourth sign, Cancer, or Crab, an animal that goes side-ways and backwards, was placed at the northern solstice, the point where the sun begins to return back again from the north to the southward. The fifth sign, Leo, the Lion, as being a very furious animal, was thought to denote the heat and fury of the burning sun when he has left Cancer and entered the next sign, Leo. The succeeding constellation, the sixth in order, received the sun at the time of ripening corn and approaching harvest; which was aptly expressed by one of the female reapers with an ear of corn in her hand, viz. Virgo, the Maid. The ancients gave to the next sign, Scorpia, two of the twelve divisions of the zodiac; autumn, which affords fruits in great abundance, affords the means and causes of diseases, and the succeeding time is the most unhealthy of the year, expressed by this venemous animal, here spreading out his long claws into one sign, as threatening mischief; and in the other brandishing his tail to denote the completion of it. The fall of the leaf was the season of the ancient hunting; for which reason the stars which marked the sun's place at this season, into the constellation Sagittary, a huntsman with his arrows and his club, the weapons of destruction for the large creatures he pursued. The reason of the Wild Goat's being chosen to mark the southern solstice, when the sun has attained his extreme limit that way, and begins to return and mount again to the northward, is obvious enough; the character of that animal being that it is mostly climbing and ascending some mountain, as it browses. There yet remains two signs of the zodiac to be considered with regard to their origin, viz. Aquarius and Pisces. As to the former, it is to be considered that the winter is a wet and uncomfortable season; this therefore was expressed by Aquarius, the figure of a man pouring out water from an urn. The last of the zodiacal constellations was Pisces, a couple of fishes tied together that had been caught; the lesson was—the severe season is over; your flocks do not yet yield their store, but the seas and rivers are open and there you may take fish in abundance.

Although the heavens appear to be every where studded with stars, yet their number visible to the naked eye is much less than is generally supposed, being only about 1000: the reason why there appears to be so many more than there really are, particularly on a bright winter's evening, is that our eyes are deceived by their twinkling.

As the stars do not, like the moon and other planets, shine with a borrowed light, and as they are situated at such immense distances from the sun and from each other, Astronomers have been led to the conclusion that they are to other systems what the sun is to ours, the centre and the great source of light and heat, and that these systems are also inhabited by sentient beings like ourselves. If this supposition be true, how inconceivably vast must be the extent of that system of worlds, compared with which, this earth dwindles into insignificance and nothingness! In contemplating this subject the mind is bewildered by its magnitude, and we can only exclaim, "Great and marvellous are thy works, Lord God Almighty."

REMARKS ON ECLIPSES OF THE SUN AND MOON.

Eclipses have in all ages attracted the attention of mankind; the ignorant and superstitious have viewed them with terror, and in former ages they were considered as forerunners of national calamities. The Chinese, even at the present day, upon their appearance, perform the most absurd and superstitious ceremonies, though they are so far acquainted with their nature as to predict them: but these idle and bigoted notions were once of no small value to Christopher Columbus, who, in 1493, was driven on the island of Jamaica, where he was in the greatest distress for want of provisions, and was likewise refused any assistance from the inhabitants; on which he threatened them with a plague, and told them that, in token of it, the following night the moon would rise with a threatening and bloody aspect. He knew the moon would be eclipsed that knight; but the Indians made light of the prediction till they saw it verified; on which, in great terror, they strove who should be the first in bringing him all sorts of provisions, throwing them at his feet, and imploring his forgiveness. But true philosophy has taught us, that instead of these appearances being portentous of evil to mankind, they may, by proper observations upon them, be made of great advantage to science, and even to some of the arts of life.

The doctrine of eclipses proves to us, that the darkness which covered Judea and the neighboring countries, at our Saviour's crucifixion, was not the effect of an ordinary eclipse of the sun, for that can never happen but at the full moon,—and the passover, when Christ was crucified, was held at the new moon. The total darkness, occasioned by eclipses of the sun, never continues above twelve or fifteen minutes, whereas, that at the crucifixion continued from the sixth to the ninth hour: thus, that extraordinary darkness must have been produced in a manner we cannot explain.

The doctrine of Eclipses being the very superstructure of Astronomy, the following short, but comprehensive, account of their cause and nature, will be not only speculative for those who are not well acquainted with the science, but contemplative for the ingenious.

If the rays of light, issuing from a lucid body, fall upon an opaque body, the opaque body intercepts them, and renders a certain space beyond it dark; and this dare space is called the shadow of the opaque body, the form of which varies with the figure and magnitude of the opaque body.

All the great bodies in the Solar System are spherical, and the sun is the only lucid body in the System; therefore, all the planets and satellites, which are dark or opaque bodies, cast their shadow towards that part of the heavens which is opposite to the sun. Although all opaque bodies, on which the sun shines, have their shadows, yet such are the distances of the planets, and the size of the sun, that the primary planets can never eclipse one another: a primary can eclipse only its secondary, or be eclipsed by it; and never but when in conjunction or opposition of the sun. The primary planets

are seldom in these positions, but the sun and moon are so every month, therefore, the only eclipses that fall most directly under our observation, are those of the sun and moon.

The Sun is eclipsed, when the moon comes between the earth and the sun, and intercepts his light, so that the whole or some part of the sun's disk appears dark: and this happens only at the time of conjunction, or new moon.

The Moon is eclipsed when the earth comes between the sun and moon, intercepting the sun's light, and preventing it from falling on the moon, so that her disk is wholly or partly dark; and this takes place only at the time of opposition, or full moon.

If the moon's orbit were coincident with the plane of the ecliptic in which the earth moves, and the sun appears to move, there would be a central eclipse of the sun to some parts of the earth at every new moon, and a total eclipse of the moon at every full moon; for, in this case, the centres of the sun, moon, and earth, would be always in the same straight line at these times. But one half of the moon's orbit is elevated about five and one-third degrees above the ecliptic, and the other half depressed as much below it; these circles, therefore, intersect each other in two opposite points, called nodes; when the sun and moon are more than 17 degrees from either of the nodes at the time of new moon, the moon is then generally too high or too low in her orbit to cast any part of her shadow upon the earth: and when the sun is more than 12 degrees from either of the nodes at the time of full moon, the moon is generally too high or too low in her orbit to go through any part of the earth's shadow, and in both these cases there will be no eclipse. When the moon is less than 17 degrees from either node, at the time of new moon, her shadow falls more or less upon the earth, as she is more or less within this limit; and when she is less than 12 degrees from either node at the time of full moon, she goes through a greater or less portion of the earth's shadow, as she is more or less within this limit. Her orbit contains 360 degrees, of which 17 degrees, the limit of solar eclipses on either side of the nodes, and 12 degrees the limit of lunar eclipses, are but small portions; and as the sun commonly passes by the nodes but twice in a year, it is no wonder that we have so many new and full moons without eclipses.

The average number of eclipses in a year is four, two of the sun, and two of the moon; and as the sun and moon are as long below the horizon of any particular place as they are above it, the average number of *visible* eclipses in a year is two, one of the sun and one of the moon. The lunar eclipse frequently happens about a fortnight after the solar, or the solar about a fortnight after the lunar. There are sometimes six eclipses in a year, but there cannot be more than seven, nor fewer than two: in twenty-eight years there are commonly seventy eclipses, of which forty-one are of the sun, and twenty-nine of the moon.

The ecliptic limits of the sun are greater than those of the moon; hence there will be more solar than lunar eclipses, in the proportion of 17 degrees to 12 degrees, or nearly as 3 to 2; but more lunar than solar eclipses are seen at any given place, because a lunar eclipse is visible to a whole hemisphere at once, whereas a solar eclipse may be visible to some places, and invisible to others, in the same hemisphere; the moon's shadow is small in comparison to the earth's disk, for the breadth of the shadow is only about one hundred and eighty miles on the earth's surface, even in central eclipses, therefore those places which are considerably distant from the path of the shadow, may have either no eclipse at all, or a very small one, when places near the middle of the shadow have the greatest possible.

An eclipse of the sun begins on the western side of his disk, and ends on the eastern: an elipse of the moon begins on the eastern side of her disk, and ends on the western; for the proper motion of the moon is swifter than the earth's shadow.

The moon's nodes move backward, or contrary to the earth's annual motion, 19 1-3 degrees every year; therefore a revolution is complete in about eighteen years, two hundred and twenty-four days; and if in that time a complete number of lunations was finished without a fraction, there would be a regular return of the same eclipse at the end of every period of the nodes; but this is not the case: however, in 18 years, 11 days, 7 hours, 42 minutes, 31 seconds, leap year being four times contained—but, if five times, then in 18 years, 10 days, 7 hours, 42 minutes, 31 seconds, the node, after being in conjunction with the sun and moon, returns so near to the conjunction at to be only 28 minutes, 12 seconds, distant therefrom: hence, if to the mean time of any eclipse, either of the sun or moon, 18 years, 11 days, 7 hours, 42 minutes, 31 seconds, or, 18 years, 10 days, 7 hours, 42 minutes, 31 seconds, be added, according as there are four or five leap years in the period, the sun will be the mean time of the return of the same eclipse nearly. The period of 521 years, 3 hours, 5 minutes, is still more accurate: and that of 2362 years, sixteen days, 5 hours, 5 minutes, is still more exact.

HORTICULTURE.

CAMELLIA JAPONICA.

Next to the rose, the Camellia is perhaps one of the greatest favorites, being justly esteemed in all countries as one of the choicest ornaments of the garden or conservatory. With us it derives a peculiar interest from its presenting us with its beautiful blossoms in the gloomiest period of the year, from the month of November to the middle of April. The botanical name of the Japan rose, as it is usually called, was framed by Linnæus to commemorate the merits and services of a Jesuit, or missionary, by the name of Camelli, who resided for a time among the Philippine Islands, and published an account of the vegetable productions of those regions. As the genus is now constituted, it differs but little from that of the tea shrubs, and in fact has been united by some botanists with that group of plants. The chief difference is in the structure of the stamina, which, in the Camellia, are united, while they are free in the Tea: this difference, however, does not appear to be constant, since some of the teas have polyadelphous stamina. The Camellia, as a separate genus, is constituted of five species. The *C. sasanqua*, first described by Kæmpfer, is a native of Japan, and also of China, where it was observed by Staunton, on the sides and tops of mountains. This species is known among the cultivated sorts in our green houses. The flowers are smaller than the Japan rose, properly so called. The Chinese call this species *cha-ouaw*, or flower of Tea, from its resemblance to that shrub, and from their using its flowers to heighten the scent of their Tea. Its leaves, dried in the shade, give out a pleasant odour, and the Japanese females often use a decoction of them to perfume their hair: an excellent oil is obtained from its seed.*

The *C. axillaris*, described by Roxburg, is a native of Pulo-Pinang—the lower leaves are broad and serrulate, the upper ones very entire, its flowers single, and as its name implies, borne at the intersection of the branches with each other.

The *C. Kissi*, a native of Nepaul, described by Wallich—the calyx is silky, leaves sharply serrated, and ovate oblong; it has three styles. Another species assigned to this genus, appears to be a doubtful one; it was described by Loureiro, in his work on the Plants of Cochin China, where it inhabits. This species was called *C. drupifera*, and differs from the rest in the character of its fruit.

The most conspicuous of all, is the *Camellia Japonica*, the subject of the careful attention and skill of horticulturists all over the world. It is a

* I have not observed any scent in the C. sasanqua; it is known, however, that the Chinese perfume their Tea with the *olea fragrans*.—M. F.

native of the woods of Japan, and is one of the greatest favorites of the Japanese and Chinese gardeners, and in the course of cultivation by them, many varieties, single and double, occur, as with us. We often see it figured on the tea boxes which come from China. The Japanese derive from its seed an agreeable oil which they use as a condiment.

The Camellia Japonica is a plant of easy cultivation, and repays a very slight degree of care and attention, with its rich and brilliant blossoms, which seem to unite the beautiful vivid hues of the rose with the strong succulent petals of the magnolia. The soft green of its leaf, darker than the usual tint of other foliage, its strong texture and glossy surface, harmonize with the firmness and consistency of its corolla. Excessive care is, in truth, injurious to it; too much heat or water, or too rich a soil, being equally hurtful to it. A mean temperature, or rather a low one, is best; the pot, or vase, which contains it, should be rather small in proportion to the plant; the watering it requires should be very moderate, a little more abundant at the period of its flowering, but before or after that time it needs but little moisture. The soil in which it thrives best is a mixture of peat and loam, mixed with about one-eighth of sand. The best time for fresh potting is in the summer, two or three months before it is necessary to remove it to the green house. It is impatient of heat or excessive light, and therefore the temperature of a room or green house that is but few degrees above the freezing point of Fahrenheit's thermometer, just enough to prevent the frost from access to the plant, will preserve it in a healthy state, and induce it to blossom. It should be placed, when taken out of the green-house, and during the summer, in the open air, protected from too great power of the sun.

A number of kinds are mentioned in the catalogues of the Japan rose. Every difference in form, color, or other property of the flower, constitutes a distinct variety, which can be perpetuated by inarching or by layers, and the intermixture of the pollen of any of these varieties will produce a seed which in all probability will give rise to a new succession, differing in some particulars from any previously existing. Hence the multitude of names, which the kinds receive, are altogether unknown to the botanist, who acknowledges only the original species.

The following list embraces the most approved kinds cultivated in Europe, and we are happy to be able to add a very considerable accession to the stock of beautiful and magnificent varieties produced in our country. For this list we are indebted to Mr. Michael Floy, an able, scientific horticulturist, whose experience and success in cultivating the Camellia are not exceeded by any one in this or any country. We shall give it in his own words:

Messieurs Editors,

The notice you request of my Camellias applies, I presume, to the choicest kinds, which I have cultivated from European originals; these I shall

accordingly enumerate, and add some others, which I have raised myself from seed.

1. The *C. Japonica v. rubra*, or single red, is now used altogether for stocks, on which the double kinds are inarched. The original single red strikes from cuttings generally; and it takes about three years before they are large enough to receive the double kinds.

2. The *C. alba fl. pleno*, double white, is a very beautiful flower, being large, very double, the petals lying regularly and handsomely, and the color rivalling the snow in its pure white.

3. The *C. rubra fl. plen.*, the double red, is a large double flower, but the shape and formation of the flower is irregular. It is not completely double, and shows a few stamina in small bunches.

4. The *C. variegata*, the double striped; this kind also is not completely double, rather more regular in shape than the last; the flowers are red, handsomely striped with pure white, like a carnation pink; and the foliage is large, glossy, and deep green.

5. The *C. anemoneflora* and *the Waratah*, which is the same thing; the flowers are of a rich crimson, the outside, or guard petals, are flat and expanded, and the disk or centre quite full of small petals, like a fine double anemone, which gives the flower a beautiful silky appearance. The central petals are the same color as the outer ones.

6. *C. pæoniæflora*, pæony-flowered. It is perhaps difficult to say why it is so called, having little or no resemblance to a pæony, unless it was thought to be like the Chinese *Moutan*, or Tree-pæony, when it was first introduced from China. It is, however, pretty, the color is a pink or flesh; it approaches somewhat in appearance to the Waratah, but the centre, although quite double, projects considerably more than the former kind.

7. *C. Pomponia*, or Pompone, is precisely the same in shape and formation with the preceding, except in color, which is white, with a few stripes of red. This kind has been also called the *Kew-blush*. It is unquestionably a sported variety from the other kind, as I have often observed flowers of this variety on branches of the other, but have not noticed flowers of the other on branches of this; the former is most certainly the original.

8. *C. myrtifolia*, or myrtle-leaved; the leaves of this kind, although much smaller than any of those of the preceding sorts, are not by any means as small as a myrtle. It is, however, a most beautiful variety; the flowers are very double, lying regularly in a curious manner, like winding stairs, each petal turning up at the edges, which are of a deep red, the lower or inner part being of a pink color. This is the only kind that has been discovered to be scented, and only at certain periods, particularly early in the morning, having something the smell of a Daphne; the formation of the flower, when fully expanded, has somewhat the appearance of shell work, or a flower made up with painted shells.

9. *C. carnea*, or more properly, *C. rosea*, the Middlemist's Camellia; the flower, though not quite double, is yet very regular in shape, of a good rose color, and free flowerer.

10. *C. incarnata*, sometimes called *flavescens*, the Lady Humes' blush, is a most beautiful kind; the flowers are of a very delicate blush, very double, even, and regular, the petals lying over each other, so as to form a hexangular shape. Though not quite so large a flower as the double white, yet the beautiful form, delicate texture, and fine light blush color, have induced many to give this kind the preference to double white, and between two flowers both perfect in themselves, although differing in shape, it seems difficult to decide which is entitled to the preference.

11. *C. atrorubens*, commonly called Loddige's red. From the appearance of the leaves and flowers, we should incline to the opinion, that it was a hybrid production between the old double red, and the Anemoneflora. The flowers have something of an anemone-appearance, but are not enough in that style to be ranked among that class; it is, however, a good double flower, of a darkish-red color, and an abundant flowerer, generally in bunches; the foliage is large, and the form of the tree very handsome.

12. *C. luteo-albicans*, or *Welbankiana*, Welbanks. This is a large double white, the flower very different in shape and make from the old double white, being in form more like the common pæony. It is very double but shows some stamina in small bunches, and on the whole is a beautiful flower.

13. *C. alba*, single white; although this is a single flower, the sort is much esteemed; the flowers expand freely, showing their yellow centre of stamina: the leaves are large, glossy, and resemble in appearance, the striped kind; when in full flower it is a beautiful plant, and has borne a few seed, which fanciers esteem for the production of new sorts.

14. *C. fimbriata*, or white fringed. We have not seen this kind flower here as yet, the plants not being large enough. It is described by those who have seen it, as a very handsome sort, with the edges of the petals curiously fringed.

15. *C. sasanqua*, Lady Bank's tea-leaved. This is a distinct species, and is a matter of doubt by modern botanists, whether it should be a *Thea* or *Camellia*. If these genera are to be distinct, this may be considered as the connecting link of the two. The leaves approach very near to the *Thea Bohea*; the flowers are white and semi-double, having more the habit of Camellia than Thea.

16. *C. sasanqua rosea*, double rose colored Sasanqua; a beautiful variety of the former.

17. *C. oleifera*, or oil-bearing, sweet scented C. This is also perhaps a distinct species, perhaps a different genus. The oil it produces is said to be very valuable; the leaves and plant have a very remarkable fragrance. We have not seen the flowers of this species yet.

18. *C. axillaris.* This kind is more tender than the other, and to our knowledge has not produced flowers here yet.

19. *C. rubricaulis*, Lady Campbell's; a pretty, small, double red kind, having something the habit of *C. myrtifolia*, and probably was raised from that kind. It is not full double, the color is however quite handsome.

20. *C. conchifiora*, shell flowering. The flowers are handsome, of a pink color, not quite double, but very regular and pretty.

21. *C. hexangularis*, is a scarlet Waratah, forming a six-angled pyramid, with its crowded petals; it is very handsome.

To this list might be added several kinds that have been produced from seed in Europe, although I have not seen any of them that, in my opinion, would compete with the old sorts. *C. splendens*, is a pretty good semi-double; flowers red with some white stripes. A large kind, called the *C. reticulata*, has been lately introduced into England, from China, by Captain Rawes; it is figured in the Botanical Register. The flowers, which are red, appear to be very large, irregular in shape, and uneven. showing bundles of stamina; the foliage appears to be large and handsome, I have not had an opportunity of examining the plant, and cannot say whether it is a variety of *C. Japonica* or, as conjectured, a distinct species.

Among the varieties which I have procured from the seed,—twenty-five sorts of which I have to include in the *Camelliæ Americanæ*,—I can enumerate a few which are truly superb: the following would be considered so any where:

1. *C. Clintonia*, Clinton's Camellia; named by me in honor of the late Governor Clinton. This is a kind of anemone-flowering variety, the outside petals are large, and of a crimson scarlet. The middle or central petals are small, scarlet and white striped, showing interspersed a few yellow stamina, which has a pretty effect. This kind is valuable, as it produces seed easily. The old plant has now ten seed pods on it, and as the flowers are large, will no doubt produce many handsome new varieties.

2. *C. Hoffmania*, Hoffman's C.; named after the late M. Hoffman, formerly President of the New York Horticultural Society. The flowers are a dark crimson, double, and of a hexangular form; it is a free flowerer—the flowers remain on the plant a long time, and the foliage is very handsome.

3. *C. Hosackia*, Hosack's C.; in honor of Dr. Hosack, patron of the Horticultural Society. This is a very beautiful kind; the flower is completely double, and of a fine brilliant scarlet, and delicate texture; it expands quite flat, and appears to be a very free flowerer. The original tree is about six feet high, and has continued in flower from the middle of November to the present time. I have no hesitation to pronounce this to be one of the finest red Camellias ever known.

4. *C. Lorillardia*, Lorillard's C.; in compliment to Jacob Lorillard, President of the Horticultural Society. The flowers of this kind are double, of a rich crimson velvet color and texture, very brilliant, and a fine variety.

I could add many more, but this may suffice for the present. I will barely notice a fine new kind, which I call after our favored metropolis, *C. Noveboracensis*, New York C. This is an extraordinary large flower, the petals measuring across five and a half inches. It is a fine semi-double, with four tier of petals, which are of a crimson scarlet, with white flakes and tints; the centre is pretty and well shaped; the filaments are white, with yellow anthers. The flower has a superb and imposing appearance, much like that of a large pæony.

I have orders from England for my No. 1, No. 3, No. 7, and No. 8; and I have sent a drawing of my New York Camellia there, in order to shew what we are capable of doing in this department.

Yours, &c. MICHAEL FLOY.

THE GUACO OR HUACO—HERB.

Mikania Guaco. Humb. and Bon.

Messrs. Editors,

Having been recently favored by my friend, Mr. Castello, of this city, with a quantity of the leaves of this remarkable plant, and having ascertained that the seeds of the same can be procured, I beg leave to make this communication in the hope that a plant of the reputed virtues of the Guaco may be introduced into this country. This plant is a native of South America, and is common on the northern coast of Colombia. It is there used by the inhabitants as a remedy against the bite of venemous reptiles, and also, as it is alleged, for the bite of mad dogs. Mr. Castello informs me,—and his statement is corroborated by Sir Robert K. Porter, the British Consul in Colombia, who has sent specimens of the plant to the College of Physicians in London,—that the plant has been known for many years to the Indian conjurers or quacks, who use the plant among others as a preventive from injury by the bite of venemous snakes; an injury which would prove fatal in a very short time to any one who had not previously been fortified by this remedy. The Guaco leaves are used both internally, by taking its juice, and externally, by inoculation or inserting the leaves in punctures made in the flesh of the patient. This precaution, it is said, will secure any person from danger from any kind of snake, which he may handle afterwards with perfect safety. This inoculation is repeated semi-annually by the Indians. A fact still more interesting is that if a wounded person applies this expressed juice of the Guaco immediately to his wound, no dangerous consequence ensues, and a cure is certain. Sir R. K. Porter mentions that a South American physician, having observed a native handling a snake of the most dangerous kind without any fear and with the utmost

impunity, yet on examining the snake minutely he perceived that it retained all its power and venom, he was told of the Guaco having been first used by the native before he ventured to touch a snake, and that the effect of it was to render him perfectly innoxious. The physician, on this representation, was induced to try the effect of the Guaco on himself. He suffered the man to inoculate him with the juice, and drank some of it; he then took hold of the snake, and found him perfectly harmless and unable to exert his venom against him. The same experiment was repeated on several of the servants of the physician with the same result.

The Guaco is not only used by the inhabitants as an antidote against venomous animals, but as a remedy in many diseases, such as rheumatism, &c. I am in hopes that experiments may be made on the plant to ascertain what medical virtues may be found in it.

The Guaco, as will be perceived, belongs to the composite class of plants, and its affinity is not remote in its natural as well as medical properties from our *Boneset* or *Eupatorium perfoliatum*. The species has but recently been added to the catalogue of plants, by the researches of Homboldt and Bonpland. The stem is cylindric and climbing, like the mikania so common in autumn, on our hedges near streams. It is branching, channelled and hairy; the leaves are petioled, opposite, oval, acuminate, bristly, below, denture distant and about eight inches in length. The flowers are axillary, in corymbs, opposite, and leafy—calyx four leaves, enclosing several flosculi of white color—stigmas very long, diverging. Seeds linean—pappus sissile. It has a strong odor, and grows on the borders of rivers and streams in warm and humid places.

Yours, L. FEUCHTWANGER.

MISCELLANY.

THE PHILOSOPHY OF FICTION.

[From the Asiatic Journal.]

THE *Arabian Nights' Entertainments* have extended their fame and facinations almost all over the civilized world. But while they have been read with delight by the imaginative, they have been reprobated by the unimaginative as being exceedingly absurd and ridiculous; full of the most outrageous improbabilities, leading to no moral good whatever, containing no precepts for the guidance of life, no principles of wisdom for the improvement of the heart. If, indeed, these and similar productions were read and enjoyed only by the weak and the wicked, by the indolent and the mischievous, then might we readily join in the vituperation of them, pronouncing them stark naught and utterly worthless. Men, however, of pure morality, of high intellect, of good taste, of active minds, and of useful lives, have read them, and have been delighted with them. It is clear, therefore, that the appetite for fiction is not a diseased appetite, that it is not a vicious exception, but a part of the general rule of humanity. For it is not only in one region of the globe, or by one variety of the human race, that works of fiction are relished and, if we may so speak, consumed; they are the staple production of the whole civilized globe, and under various modifications they have found their way into every nation and every tribe. A habit so prevalent and so general must be founded on some principle or situation common to the species; and whatever variety there may be, in different nations and in different ages, in the taste for this and that kind of fiction, must arise from some peculiarity of circumstance, more or less obvious; and as a psychological curiosity it is worth while to investigate the general principle, and to inquire into the causes and indications of its several varieties.

In the first place, as to the general principle: to love fiction, as fiction or falsehood, merely for its own sake, cannot be a natural propensity in man, who rather possesses an inherent love of truth, and a repugnance to falsehood and deception. There is a pleasure, therefore, deriveable from fiction independent of its being fiction, and it is obvious that the narration of imaginary adventures never pleases so strongly as when the hearer or reader is impressed for the time being with a sensation of verity. He may know that he is *about* to listen to a fiction; he may know that he *has* listened to a fiction; but, while he listens, he enjoys a sensation, not a conviction, of truth. This appetite for fiction has its foundation in a natural condition of humanity, heightened and strengthened by the artificial circumstances of civilized

life. Its first element is sympathy or fellow-feeling; and its first impulse is from mental leisure and the absence of bodily excitement. All the human appetites, in the gratification of which consists the enjoyment of life, are the prompters and springs of man's actions; and as there is a pleasure in the gratification of the appetites, there is also an interest in the means used to obtain their gratification. Now, taking man in the simplest state of his being, living by means of hunting or fishing, much of his time is employed in pursuit of game, some in eating, and much in sleep. Still some time remains unoccupied, and that time must be employed in thinking, that is, in recollecting the past or in anticipating the future. So long as the mind continues awake, it must have employment, either actual, in the pursuit of some object, or speculative, in the recollection of that pursuit. But man, being nautrally of social and sympathetic habits, feels an interest also in the pursuits, accidents, and adventures of others; and when companions in the same, or partakers of similar, pursuits, assemble together, they have an interest in a social recollection, and a sympathetic pleasure in talking of their adventures. The pleasure which one man feels in listening to the adventures of another, is a pleasure of sympathy; and the merit of a narrator consists in the vividness with which he can bring scenes and situations before the mind's eye, and the dexterous rapidity with which he can make events succeed each other, stimulating but not distracting the attention. Narratives, being listened to with pleasure, not for the sake of information, but by way of mental stimulus or recreation, are the most delightful when they undergo, on the part of the narrator, a little coloring and exaggeration: hence arises the poetry of romance. Exaggeration of fact is not enough for the gratification of the imagination; there needs also an exaggeration of feeling. If, for instance, the wild hunter, in pursuit of his game, is brought to the brink of a precipice, down which he might have fallen, it is not enough for the sympathy of his hearers that he tell them the exact height of the precipice, or that he exaggerate its dimensions a hundred fold; for the imagination of the listener is passive, and he who tells the story must not only give materials of which pictures may be made, but he must present the pictures to the mind's eye ready-made; and he must not only give the materials for emotion, but the very impulse to emotion; therefore he will use figurative language and metaphorical expressions, by which he will present to his hearers not only the visible and actual scene, but the feelings of him who has been engaged in it. So, we observed, that in almost all languages there is a common stock of epithets, by which every part of the visible world, and every movement and phenomenon of nature, is impersonated, and by human imagination impregnated with vitality.

A pleasure having been experienced in listening to a well-told tale, colored by feeling and exaggerated as to fact, the step from founded to unfounded fiction is short and easy: more especially as civilization advances and mental leisure increases. It is indeed a very natural propensity in man,

whose pursuit is pleasure, to convert into an occupation that which at first was a delightful recreation. Hence arose the profession of story-tellers, who abound in the east, and of novel-writers, who abound in the west. As a refinement on spoken narrative, then arose the acted narrative or drama, by means of which, passions and emotions, joys and sorrows, were not merely spoken of, but exhibited and made visible and audible in their influence on living individuals. But nature herself decidedly assists us in the formation of, and prompts us to the task for, picturing narrative and dramatic representation, by her own ingenious and curious economy of dreams. A dream is a natural romance, comedy, or tragedy, as the case may be. It is in nature, though not in being. It is true, though not a fact. It is composed of veritable materials, though it has no veritable existence. It is made up of experiences, and hopes, and fears. The elements are our own, but the combination of them gives them novelty and strangeness. As, when the system has been saturated with sleep, there comes the dream, which is the twilight of our waking being, so, when the frame is wearied with its pursuits and exertions, the mind seeks a stimulus from sympathy with narrated, imaginary and dramatized adventures. It would be, perhaps, the perfection of luxury to be put to sleep every night by a good play, and awakened every morning by a gorgeous dream. The Turks, who are a luxurious people, and understand the philosophy of sensuality, are fond of story-telling, and love opium. Opium is a kind of vegetable romance, a portable and tangible dream. Under its influence the mind is passive, and the eye may see whatever it asks for. By the power of opium, the teasing reality of daylight is shaded down to a picture, like beauty, and the black mantle of night is embroidered with splendid creations. Opium brings to the mind the very essence of romance, investing it with dramatic visibility, kindling its strongest sympathies, turning over its leaves and shifting its scenes silently and most opportunely, and making its transitions with a striking dexterity and a sweet surprise. In all this is an anticipated fiction: so it is with dramatic representations; for though, in reading a printed book, we may possibly be led into the error of supposing that fiction is fact, it is impossible that we should take our seat in a theatre with any apprehension that we are about to witness real events. And as, in the arts of painting and sculpture, those are the finest productions which are most like nature; and in nature, those are the most beautiful objects which are most like art: so in narratives, those are the pleasantest pictures which are most like facts; and those the pleasantest facts which are most like fiction. The reason is obvious in either case: for similarity in art to nature is the perfection of the artist; and nature, when she resembles art, is then in her finest attitudes, and most beauteous or interesting forms, inasmuch as art seeks for and records that which is extraordinary in beauty and interest.

The love of fiction is so general and so powerful that it not only distinguishes the luxurious people who make pleasure their business, but it lays

hold of strong and active minds: some of our most eminent scholars and statesmen have found recreation in the sympathies of romance. They however have used it only as a relaxation, whereby they have been strengthened and refreshed, and saved from the pedantry which clings to uniformity of pursuits and oneness of mental object.

In the second place, as the propensity to be amused with fiction is so universal, and as fictions of various kinds have interested and amused various people, something may be learned from an inquiry into the causes and indications of its several varieties. In an early stage of civilization, when the belief in frequent or habitual preternatural agency was universal, there were scarcely any fictitious narratives in which this agency was not introduced. Here the exercise of the imagination was strongly called into play, and with an exceedingly intense interest. For though the belief in fancies, witches, genii, &c., was a delusion, and though no individual listening to or reading these narratives had ever seen one of these preternatural beings, or had ever experienced palpable good or evil at their hands; yet they did imagine that they had had distant glimpses of them, and they attributed to them much that was the result of purely human agency. Therefore they felt an excitement of curiosity to come nearer to them by means of the sympathy of narrative, so that there might be a mental excitement without bodily danger. This kind of feeling, by the way, differs not much from the almost universal wish to enjoy the sublime agitations of a storm or a battle, secure from personal danger and bodily harm. Myriads believing in ghosts, genii, and the like, are mightily interested in stories concerning them, but would be very reluctant to undergo an actual visit from such a guest. The same kind of narrative which pleased the world in its infancy still pleases individuals in their childhood. It is a stimulus to the mind. It is the earliest species of dram-drinking. It is the opium of infancy: and when the mind, as in the infancy of the individual, or the infancy of the species, has little to think of, little to recollect, and a small ground whereon to build the palace of hope, it covets fiction for its amusement; and knowing little of the natural, it is pleased with the preternatural. The Orientals, in their fictitious narratives, shew symptoms of unfurnished, uncultivated, unreflecting, and unobservant minds; for though there is a vanity of character in the humanity with which they are conversant, they seem not to regard and discriminate the variety: so we see, for the most part, that the interest of the fictitious narratives is in incident and situation, not in character. It is altogether a matter of time, place and circumstance. The attention is always aroused and kept from flagging by perpetual and unexpected changes of scenery and condition. The *Arabian Nights' Entertainments* are read by Europeans from a mixed motive. They gratify curiosity as illustrations of foreign manners: they are a species of imaginary travelling; they delight as gorgeous pictures, in which the brilliancy of the coloring is more admired than the art with which it is laid on. Little indeed can be argued

from the reading which delights or engages a people of such multifarious pursuits as the people of Europe. They read from so many motives altogether independent of pure pleasure. They read from ambition of knowledge, and shame of ignorance, and desire of shining in conversation; or they read that, by means of which they may enrich or support themselves. The fictitious narratives therefore of Europeans, especially of the English, lead us but a little way in ascertaining the character of the people. In the infancy of European civilization, the outrageous and indiscriminating romance, which even now delights the early years of youth, gave sufficient token of the unreflecting and unfilled mind: but there still was a difference, and the result has shewn that there was a difference, between the spirit of the European romance and the curiously wrought tale of Asiatic adventure. Europe has outgrown its romance, but Asia has not outgrown its luxurious and fanciful tales. In the romance, was a spirit of restless ambition, a desire of high enterprize, a looking upward to something worthy of a knight and a soldier; there was in it a kind of homily on courage, a persuasion to personal prowess; instead of relaxing, it braced the mind, and lifted up to high thoughts. Now the Asiatic tales are of a nature to let the mind sit more easily on the couch of luxury and indolence; they indicate a sympathy with fate, rather than a sympathy with an energy that defies fate and contends against destiny. The spirit of the romance is of the same nature as the spirit of the bards who sang odes in honor of the mighty dead and awakened the soul of departed warriors. The sympathy of their hearers was with high exploit; and as there was pleasure in the recollection, there was also a pleasure in the anticipation of great and mighty deeds. In listening to the song of the bards there was a relaxation but a refreshment also of mind. These northern people did not convert the luxury of their imaginations into a means of weakening and effeminating their minds; but they used it as a prompter to activity, and a stimulant to high enterprize. And as, in all the various developments of national peculiarity, we see at once cause and effect: so it will be seen that in heroic fictions of the northern tribes, there was an indication of their character, and an impulse to the habits and pursuits which formed it. They delighted in the songs of the bards, because they delighted in the conflicts which those songs recorded; and by the poetical fervor with which they celebrated and recollected high exploits they were led to an increased ambition. And they who listened with rapture to the songs of the bards, overran the provinces of those who were charmed with the fairy tale.

The people of ancient Greece had a fictitious literature. This was for the most part dramatic and heroic. They celebrated great exploits, and dramatized the doings of the gods. They have left no samples of imaginary adventures or of fairy tales, though in their dramatic and epic writings they exhibit a belief in preternatural agency. In the siege of Troy is seen the spirit that could relish the *Iliad;* and in the taste which relished the

Iliad may be also discovered the spirit which would carry on the siege of Troy. And it is pretty evident that the heroic age, in the Grecian annals, was also what may be called their barbarous age. In considering the situation of ancient Greece, with reference to its fictitious literature, another feature in the philosophy of fiction is displayed, namely, the degree in which its quality and quantity depend on the form of government. The ancient Greeks were what is termed free people, that is, they had a very multitudinous government. Almost every free man was a politician and a statesman; so that, besides having his own business to attend to, he was also occupied with the business of the state; therefore he had little time and less interest for pure fiction, and his very elegant literature savoured much of politics. What a marked difference, for instance, between the comedies of Aristophanes and the French comedy of the age of Louis XIV! The perfection of elegant literature seems to demand the influence and almost despotism of a court. Indeed, where a people is prohibited from discussing realities, it must betake itself to fiction or to science; but the latter can hardly ever be popular enough to become universal.

The ancient Romans are a still further illustration how much a continual actual pursuit excludes fictitious literature. They were a free people, and a fighting people, and for many ages they seem to have had comparatively no literature. They had, in fact, no occasion for it, inasmuch as they had no leisure for it; and they could not spare from their wars any part of the community to stay at home for the cultivation of literature. But when the government was taken out of the hands of the multitude, and when the splendor of a court superseded the bustle and agitations of the forum, then literature was cultivated, and then rose the Augustan age. Even then, however, their literature differed much from the fictions of the subjects of the more perfect despotisms of Asia.

Fiction seems, therefore, to to be a natural production of the human mind, and an almost essential resource of its leisure. It is modified according to circumstances, to which it yields an impolitic obedience. In our own country we may observe it in all its forms. We have enough of a court to lead to the cultivation of fiction, enough of popular interest in government to mingle politics with literature,—for such works as the Edinburgh and Quarterly Reviews are peculiar to us;—we have also the military spirit to make us enjoy heroic literature, and we have numbers sufficiently at leisure to pursue the flowery path of pure fiction.

RAIL ROADS.

The successful experiments which have been made in this mode of conveyance have created an excitement in this country, which, if unchecked, may prove ruinous to vast numbers. We are a people extremely sensitive to new speculations that promise well on paper. The speculation in turnpike roads, merino sheep, and manufactures, with many others, might be noticed. Enterprise should not be too much stimulated nor depressed by unreasonable anticipations of failure. Although the early undertakers may be sacrificed, it is frequently said the country is benefitted by their misfortunes. They are, it is said, pioneers for others, who profit by their temerity. But if laudable enterprise can be so cautioned and directed, as to avoid the rocks on which it is liable to be wrecked, a real service is done to the individuals concerned and the country. That there are parts of our country through which Rail Roads may be constructed with a reasonable prospect of receiving compensating tolls, we believe; but they are not as numerous as many suppose. The practicability of constructing a firm and durable road by a moderate expenditure depends, among other things, on the soil—the streams over which it must pass—and the materials required that can conveniently be procured for its structure. The approximation to a level, which the formation of the country will admit, through which the road is to pass, is also an all-important consideration. In a dissertation on the Liverpool and Manchester Railway, contained in the Mechanic's Magazine, it is said that an engine, drawing thirty tons on a level at fifteen miles an hour, will draw no more than seven tons at the same speed up an inclined plane, rising one yard in a hundred; the increased ratio of power required to propel a car rising *two* yards in a hundred, for instance, is much greater than in a *direct* proportion, and the degree of elevation is soon reached at which the wheels will continue moving, while the body of the car will remain stationary, or in other words, there will be no forward motion.

Admitting the surface of the country, and the materials it affords for constructing the road altogether favorable, what amount of travel and transportation will be required to compensate for the expenditure? The interest of the investment, the necessary repairs of the roads, the unavoidable contingent expenses, with the cost and repairs of the vehicles used and the continued consumption of fuel, are all items that require minute and accurate calculations. The only safe data must be derived from actual experience. The experiments on the Liverpool and Manchester Rail Road are the most accurately detailed of any that have come to our notice; and it is said to be at this time in successful operation. But we must not forget that its location is one of the most favorable which the world affords. More than one thousand tons of merchandise and other commodities pass daily between Liverpool and Manchester, and the number of passengers is in proportion. It is questionable whether the transportation of commodities,

alone would create an income that would justify the expenditures. If they would, the charge upon passengers is altogether extravagant. Transportation formerly by the canal was 15*s*. per ton. Allowing 150 lbs. to be the average weight of passengers, the charge by the Rail Road is 60*s*. per ton. It is evident therefore, if the number of travellers is sufficiently great, the construction of a Rail Road may be warranted; whereas, if the commodities which might be transported were ever so great, and no passengers, it might still be folly to undertake to transport them by means of a Rail Road. Again, certain commodities of great value and of little weight might be advantageously transported, while others of greater weight and less value would not perhaps bear a charge at all proportioned to the necessary cost of their conveyance.

It is said the improved and increased capabilities upon engines warrant a reliance on the transportation of heavy commodities so as to supercede conveyances by canals. Admitting that they afford all the advantages canals are capable of, it must be remembered that the cost of Rail Roads will probably in ordinary cases greatly exceed the cost of canals, when the streams, &c. are favorable to their construction, and a less income may therefore compensate for investments in the latter—an income that would be inadequate to meet the expenses required by the former. A given quantity of produce with a moderate freight might compensate for the investment in canals, when the same amount of freight would not even pay for the fuel required to transport it on a Rail Road. These are suggestions which demand the consideration of those who are investing their capital in the stock of Rail Roads. They are made not with the view of cooling enterprise, but to awaken attention and provoke calculation. That the powers of engines have been in a short time greatly increased, there is no doubt. The patentees of the *Novelty*, which has been so often noticed, have contracted to furnish an engine not exceeding five tons weight, which shall draw forty tons gross, from Liverpool to Manchester in two hours, in its greatest ascent, (being assisted up the inclined plane,) which rises one foot in ninety-six. The consumption of coke they warrant not to exceed half a pound weight per ton, drawn per mile. Admitting this is accomplished, an important data will be afforded for calculation.

We advise those who have the direction of the contemplated Rail Road Companies, to examine well, as we are satisfied a single season will bring us much new light. We confess we have examined no project that, from the data afforded, viz., transportation on the Erie Canal, and the increasing travel pressing from the western world, and from the official report and survey of Lieutenant Pickele, that promises as much as the contemplated Rail Road from Canajoharie to Catskill. But we hope those who have it in charge will move slowly and surely, guided by the steady lights of experience; and it is our belief the state of New-York will hereafter possess another proud monument of her enterprise and success in promoting internal improvements.

IMPORTANCE OF KNOWLEDGE TO THE MECHANIC.

Let us imagine for a moment the condition of an individual, who has not advanced beyond the merest elements of knowledge, who understands nothing of the principles even of his own art, and inquire what change will be wrought in his feelings, his hopes, and happiness, in all that makes up the character, by the gradual inpouring of knowledge. He has now the capacity of thought, but it is a barren faculty, never nourished by the food of the mind, and never rising above the poor objects of sense. Labor and rest, the hope of mere animal enjoyment, or the fear of want, the care of providing covering or food, make up the whole sum of his existence. Such a man may be industrious, but he cannot love labor, for it is not relieved by the excitement of improving or changing the processes of his art, nor cheered by the hope of a better condition. When released from labor, he does not rejoice, for mere idleness is not enjoyment; and he has no book, no lesson of science, no play of the mind, no interesting pursuit, to give a zest to the hour of leisure. Home has few charms for him; he has little taste for the quiet, the social converse, and exchange of feeling and thought, the innocent enjoyments that ought to dwell there. Society has little to interest him, for he has no sympathy for the pleasures or pursuits, the cares or troubles of others, to whom he cannot feel or perceive his bonds of relationship. All of life is but a poor boon for such a man; and happy for himself and for mankind, if the new ties that hold him to this negative existence be not broken. Happy for him if that best and surest friend of man, that messenger of good news from Heaven to the poorest wretch on earth, Religion, bringing the fear of God, appear to save him. Without her to support, should temptation assail him, what an easy victim would he fall to vice or crime! How little would be necessary to overturn his ill-balanced principles, and throw him grovelling in intemperance, or send him abroad on the ocean or the high-way, an enemy to himself and his kind!

But let the light of science fall upon that man; open to him the fountain of knowledge; let a few principles of philosophy enter his mind, and awaken the dormant power of thought; he begins to look upon his art with an altered eye. It ceases to be a dark mechanical process, which he cannot understand; he regards it as an object of inquiry, and begins to penetrate the reasons, and acquire a new mastery over his own instruments. He finds other and better modes of doing what he had done before, blindly and without interest, a thousand times. He learns to profit by the experience of others, and ventures upon untried paths.

Difficulties which before would have stopped him at the outset receive a ready solution from some luminous principle of science. He gains new knowledge and new skill, and can improve the quality of his manufacture, while he shortens the process and diminishes his own labor. Then labor becomes sweet to him; it is accompanied by the consciousness of increasing power; it is leading him forward to a higher place among his fellow men.

Relaxation, too, is sweet to him, as it enables him to add to his intellectual stores, and to mature, by undisturbed meditation, the plans and conceptions of the hour of labor. His home has acquired a new charm; for he is become a man of thought, and feels and enjoys the peace and seclusion of that sacred retreat, and he carries thither the honest complacency which is the companion of well-earned success. There, too, bright visions of the future sphere open upon him and excite a kindly feeling towards those who are to share in his prosperity. Thus his heart and mind expand together. He has become an intelligent being, and while he has learnt to esteem himself he has also learnt to live no longer for himself alone. Society opens like a new world to him; he looks upon his fellow creatures with interest and sympathy, and feels that he has a place in their affections and respect. Temptations assail him in vain. He is armed by high and pure thoughts. He takes a wider view of his relations with the beings about and above him. He welcomes every generous virtue that adorns and dignifies the human character. He delights in the exercise of reason—he glories in the consciousness and the hope of immortality.—*Emerson.*

MATHEMATICAL QUESTIONS.

[Proposed for solution.]

BY C. HARRIS, NEW-YORK.

1. A number consisting of two digits, which, when divided by the difference of those digits, gives a quotient equal to one quarter of itself; and if the number composed of the digits inverted, be divided by the sum of the digits, the quotient is equal to the difference of the digits, what is the number?

2. Find the year in which the cycle of the sun will be one, the lunar cycle two, and the cycle of indiction three; also the year in which each of the cycles will be ten.

BY JOHN D. WILLIAMS, NEW-YORK.

1. Find the least two right angled triangles, in whole numbers, with a common hypothenuse, so that the difference of the squares of the greater leg of one, and the less leg of the other, shall be a square, and the difference of the squares of the other two legs shall be a square.

2. Find a rational right angled triangle, such that the sum of the squares of the straight lines, drawn from the acute angles to the middle of the opposite sides, will be a cube, the area equal to the cube of one of the legs, the sum of the squares of straight lines bisecting the acute angles, and terminating in the opposite legs a double square, and the perimeter increased by the sum of the diameter of the inscribed circle and side of the inscribed square shall be a square.

3. Given $x^9 + 2x^8 + 3x^7 + 4x^6 + 5x^5 + 6x^4 + 7x^3 + 8x^2 + 9x = 987654321$, to find the value of x

4. Find 15 roots of the Binomial equation, $x^{15} - 1 = 0$.

BY A. H. SANDS, NEW-YORK.

1. Make $x^2 \pm ax = \square$, $x^2 \pm bx = \square$, and $x^2 \pm cx = \square$, in terms of a, b, and c.

2. Given $44r^4 + 827r^3 - 1680r^2 + 856r = 43$, to find the four roots of the equation.

3. Given $43r^4 - 856r^3 + 1680r^2 - 827r = 44$, to find the four roots of the equation.

BY SENEX, BROOKLYN.

1. Given $x + y + z = 24$, $(x - y) - (x - z) = 6$, and the two least $y^2 + z^2 = 52$, to find the value of x, y, and z, by a simple equation.

2. Given $x + y = a$, and $a^5 + y^5 = b$, to find the value of x and y, by a simple equation.

3. Given $z^3 + y^3 = a$, and $xy(x + y) = b$, to find the value of x and z, by simple equation.

BY M. FLOY, JUN. NEW-YORK.

1. Multiply 311 f., 4^1, 7^{11}, by 36 f., 7^1, 5^{11}, and give a general and easy method of solving questions of this nature.

2. Given $x^6 + 2x^5 + 3x^4 + 4x^3 + 5x^2 + 6x = 654321$, to find the value of x.

3. From Bonnycastle, given $44000x^2 + 1 = z^2$, to find x and z in whole numbers.

SCHOOLS, SOCIETIES, &c.

CLINTON HALL ASSOCIATION,

AND

MERCANTILE LIBRARY ASSOCIATION.

As the present number is embellished with a view of the splendid *Hall* built by the first of these associations, principally for the accommodation of the latter, by which it is partly occupied, some notice of the two seems to be peculiarly appropriate at this time.

The Clinton Hall Association was formed, as we learn from the report of the trustees, for the laudable purpose principally of furnishing, gratuitously, to the Mercantile Library Association, a LECTURE HALL, and convenient apartments for its *library* and *reading room*, and also to lay the foundation for a large and continually increasing *library* for the use of the mercantile community, "which would in some measure," observe the committeee, "remove the reproach so often cast upon New-York, that, in comparison with a neighboring city, its means of instruction in literature and science are but scanty." The object thus announced is one which every intelligent

and liberal minded citizen of the commercial metropolis cannot but approve and be desirous of promoting, and is worthy of the liberality of those who generously advanced the funds necessary to carry it into effect. The institution having been formed soon after the death of an eminent citizen, whose name had already become identifiedw ith the great improvements which his native state had undertaken and successfully accomplished, the association very properly determined that that name should be the one by which they would be distinguished, and they therefore took the title of the Clinton Hall Association. The capital stock of the Association is $50,000, divided into 500 shares of $100 each, 321 of which are already subscribed. The Hall which the Association have lately erected, and which bears the name of the distinguishsd citizen we have just alluded to, is now occupied by the Mercantile Library Association, and by the Academy of Design (a brief account of which we gave in our last.) Connected as it is with the Clinton Hotel, (both being carried up together and constructed so as to form one entire building,) it presents a very imposing and noble aspect to the beholder, though its *effect* is much weakened by its being surrounded with other buildings that prevent its being seen at any considerable distance.

Among the numerous benevolent institutions of New-York, there are none likely to be more permanently beneficial to the youth of the city than the MERCANTILE LIBRARY ASSOCIATION. Of the origin and design of this excellent Association, we have the following account in the report of the trustees of the Clinton Hall Association, lately published. "In the winter of 1820, the destitution of instruction, and the temptation to vicious practices to which merchants' clerks were exposed in this large city, produced a powerful impression on the minds of many reflecting members of that class, and of other persons more advanced in life. They not only saw the dangers which beset these inexperienced youth, but were anxiously desirous to provide means to secure them from the surrounding evils, and they wisely determined those means should be adapted also to the cultivation and improvement of their minds. They knew that there were in New-York six thousand young men connected with mercantile pursuits;* that a great number, perhaps a majority of them, were from the country, separated from their parents; that they were residing in boarding houses, where they lived without control or restraint, and were in many instances destitute even of friends whose advice might check the impulses of their passions, or turn them from the haunts of wickedness; that their evenings, during a considerable portion of the year, were lost for want of employment, or spent in those pursuits which too often destroy both the body and the mind. Perceiving these alarming evils, and feeling the necessity of guarding against them, this Association was formed for the purpose of providing "a place for inexperienced youth, where they could find instruction for their minds,

* It is estimated that there are in the city about seven thousand clerks; and that about one thousand annually enter into business for themselves.

and security for their morals." The Association at its first anniversary, in October, 1821, numbered but one hundred and thirty members, and possessed a library of 1000 volumes; its members have now increased to about one thousand; its library consists of upwards of 6000 volumes and bids fair eventually to become one of the most extensive in this city, if not in the Union.

During the past winter there have been two courses of lectures delivered in the lecture room of this Association, namely: a course on American History, by S. L. Knapp, Esq., and a course on Chemistry, by Dr. Griscom, each of which were attended by about six hundred regular auditors; and it is proposed that lectures be delivered to the members of the Association every season on some useful subjects.

The Association has met with many difficulties and encountered many obstacles, but it has overcome them all: for this success it is indebted to the indefatigable and unremitted exertions of a few individuals who have never ceased to devote themselves to its best interest; it has now obtained an elevation above the reach of accident or prejudice, and is destined to exert a most important and salutary influence in forming the characters and fixing the habits of a large and highly respectable class of citizens. To these the association has opened the treasures of knowledge, and, in the language of its worthy President, "the purest pleasures solicit the participation of them, and their immediate interests as Clerks, and their future respectability as Merchants, combine to enjoin upon them to profit by these privileges; and may it never be said of any of them, that all these advantages have been lost because they preferred the ways of folly—to spend the leisure hours of their youth in indolence, rather than in storing their minds with information that shall tend to elevate their character, and ensure the respect of their fellow men."

AMERICAN INSTITUTE.

We are pleased to learn that the American Institute is taking measures to obtain detailed reports of the state of our manufactures generally, and in this city in particular. It appears by the few facts already developed that the progress of productive industry in manufactures and the mechanic arts in this country is almost incredible. In 1807, the amount of sales in this city at auction of goods not dutiable, which includes domestic goods, was only $726,165 73, while the dutiable or foreign goods amounted to nearly twelve and a half millions of dollars; and only eight years ago the amount of goods not dutiable, sold at auction, was but $1,798,880. The same year the sales of foreign goods at auction were $12,340,127.

In 1830, the sales of foreign goods were less than fifteen and a half millions of dollars and the amount of goods sold at auction, not dutiable, were

$10,300,705 79! A triumphant illustration of the American system. But this is not all—the indefatigable Mr. Williams, whose Register is so honorable to himself and so useful to the public in displaying the resources of this great state, has made an investigation, approximating to accuracy, of the manufactures disposed of at private sales (not including the products of our mechanics); they amounted the last year to about fifteen millions of dollars—making in 1830, with those sold at auction, the incredible amount of twenty-five millions of dollars of American manufactures over and above the immense amount of mechanical productions which have also been disposed of within the same period.

Let those who fear that manufacturers will destroy commerce, reflect on the quantity of tonnage employed in transporting the raw materials of these fabrics to work shops where they have been fashioned and finished—the wool, the cotton, and hemp, the iron and other metals that have been raised on our farms and our plantations, or dug from our inexhaustible mines. Let them reflect on the numbers engaged in vending the materials and the fabrics—the store-houses that they have filled—above all, the employment they have given in their growth, transportation, and fabrication, to hundreds of thousands of men, women, and children, and then tell us whether they really consider the American system as the enemy of American independence.

We hope the members of the American Institute will enter upon a thorough investigation of the annual products of the various branches of industry that are embraced, in particular, within the mechanic and manufacturing occupations of this city.

Questions have been prepared, for the workers in different materials, in substance as follows:

1st. The quantity produced or manufactured in this city, and in the United States.

2d. The extent of the supply for home consumption, and the amount exported, if any.

3d. The consumption of the imported commodity.

4th. The amount manufactured now and in former years, with the comparative population at the different periods.

5th. Comparison of prices, and the rates of duties, from the time duties were first imposed, in order to show the effect of duties on prices, and in order to ascertain whether the decrease of importations, caused by protecting duties, have not been more than counterbalanced by increased production, caused by the competition occasioned by the protecting duties.

The various professions and occupations that are found among the members of the Institute will be able to produce an accumulation of facts which will astonish the best informed among us, and we trust convince those who have heretofore opposed the protection of American industry, that they have opposed the true policy of the country.